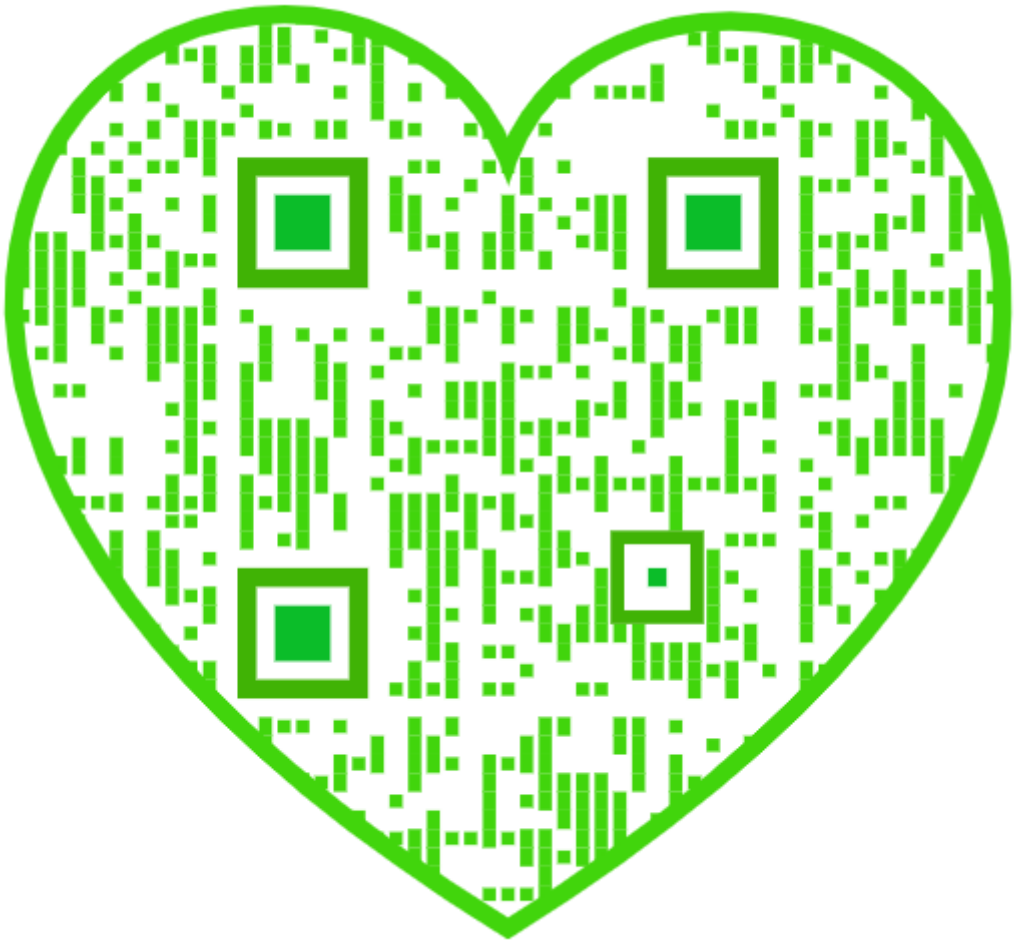

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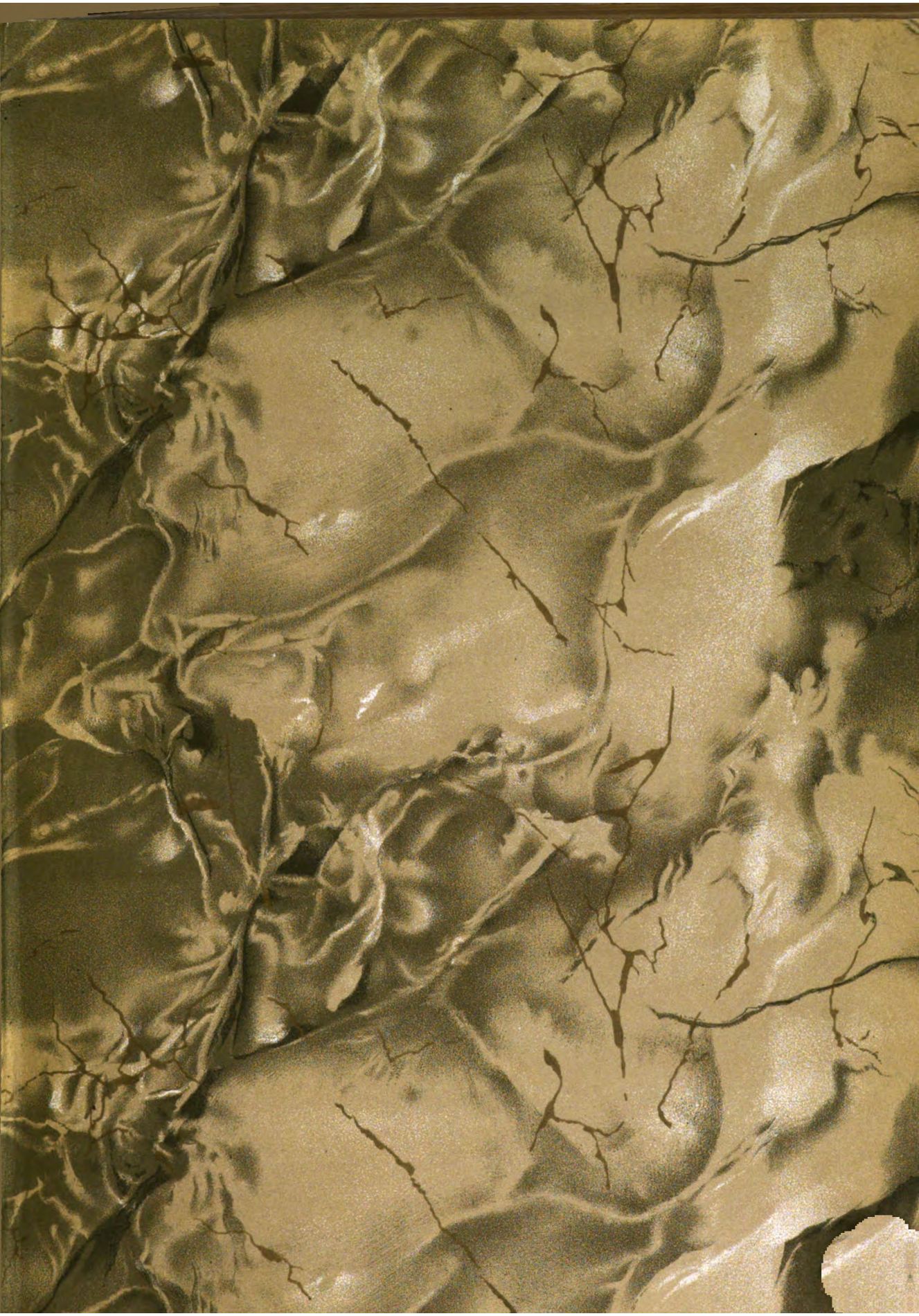

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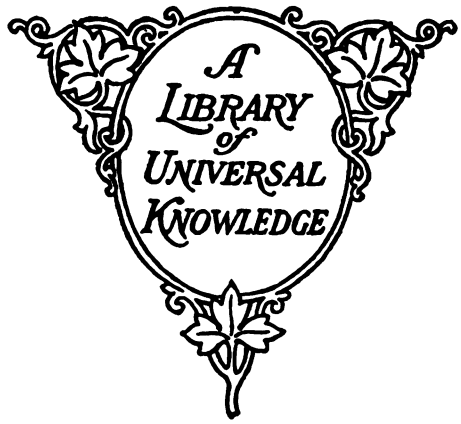

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KEY TO PRONUNCIATION.

ā	far, father
ā	fate, hate
a or ă	at, fat
ã	air, care
ạ	ado, sofa
â	all, fall
ch	choose, church
ē	eel, we
e or ĕ	bed, end
ė	her, over: also Fr. *e*, as in *de; eu*, as in *neuf;* and *oeu*, as in *boeuf, coeur;* Ger. *ö* (or *oe*), as in *ökonomie.*
ẹ	befall, elope
ë	agent, trident
ff	off, trough
g	gas, get
gw	anguish, guava
h	hat, hot
h or H	Ger. *ch*, as in *nicht, wacht*
hw	what
ī	file, ice
i or ĭ	him, it
i	between e and i, mostly in Oriental final syllables, as, Ferid-ud-din
j	gem, genius
kw	quaint, quite
ṅ	Fr. nasal *m* or *n*, as in *embonpoint, Jean, temps*
ñ	Span. *ñ*, as in *cañon* (căn'yŏn), *piñon* (pēn'yŏn)
ng	mingle, singing
nk	bank, ink
ō	no, open
o or ŏ	not, on
ô	corn, nor
ȯ	atom, symbol
ọ	book, look
oi	oil, soil; also Ger. *eu*, as in *beutel*
ö or oo	fool, rule
ou or ow	allow, bowsprit
s	satisfy, sauce
sh	show, sure
th	thick, thin
ṯh	father, thither
ū	mute, use
u or ŭ	but, us
u̇	pull, put
ü	between u and e, as in Fr. *sur*, Ger. *Müller*
v	of, very
y	(consonantal) yes, young
z	pleasant, rose
zh	azure, pleasure
′(prime), ″(secondary)	accents, to indicate syllabic stress

T

TRANCE, a state in which the voluntary functions of the body are suspended and in which a dream life is carried on of more coherency than in ordinary sleep. In some cases the only external sign of trance is the length of time during which the voluntary functions are suspended. The patient is then said to be in a trance-sleep. When the trance is deeper the action of the heart and lungs is very feeble although perceptible; the state of the patient is distinguished as that of trance-coma. When the trance is so deep that the action of the heart and lungs becomes altogether imperceptible, the body falls in temperature and no sustenance is taken, the patient is said to be in a death-trance. There are four definite sorts of trance, each differentiated from ordinary sleep: (1) The subject of a hypnotist or mesmerist, who is controlled to the point of losing consciousness of his surroundings. (See HYPNOTISM). (2) The medium who, according to spiritualistic theories, accepts the control of a discarnate intelligence and goes into a state of greater or less coma, during which he answers questions or has experiences on the astral or psychic plane, of which he is unconscious and cannot remember when he returns to a normal condition. (SEE SPIRITUALISM). (3) The state of an individual who, according to various Eastern philosophies, is able at times to leave his physical body and to travel in his spiritual body on the higher planes of life; or at least who becomes unconscious of activities on the earth plane, resting in a state of coma which his soul or ego has experienced in the world of spirits, spiritual world, heaven-world or whatever one chooses to designate it. Such were the experiences of Swedenborg (q.v.). (4) The condition of the patient who loses physical consciousness but lives and breathes, sometimes for weeks and months. (See COMA). This state is closely allied to somnambulism (q.v.). Consult Podmore, F., 'Modern Spiritualism' (London 1902); Owen, R. D., 'Debatable Land' (1872); Besant, A., 'A Study in Consciousness' (1900); Prince, M., 'Dissociation of a Personality' (1908); Hyslop, J. H., 'Psychical Research and Survival' (1913); Lodge, Oliver, 'Raymond' (1916).

TRANI, tra'nē, Italy, in the province of Bari, on the Adriatic, 26 miles northwest of Bari, a seaport on the southern coast, formerly of considerable importance. The cathedral (12th century) with handsome bronze doors and interesting crypt and castle are the chief buildings. Promenades occupy the site of the ancient fortifications. Trade depends upon oil, grain, almonds, wine and figs. During the Crusades Trani flourished, and it has been the see of an archbishop since the 11th century. Pop. 35,000.

TRANQUEBAR, trăn-kwĕ-bär', India, in Madras, district of Tanjore, 56 miles south of Pondicherry, an important seaport, with citadel and fortifications. There are two Protestant churches, a Portuguese chapel and schools for Danish, English and Portuguese, a reading-room and literary institute. A Protestant mission was established here as early as 1706, which was the first in India. There are some manufactures of coarse cloth. The Danish settlements, established in 1616, were purchased by Great Britain in 1845. Pop. of town 5,000, with native suburb of Poraivar 14,500.

TRANS-ATLANTIC FLIGHT. Up to May 1919 the aerial passage of the Atlantic Ocean was a surmise with a hope of early success, because its possibilities had been worked out, in theory, as beyond a peradventure. The American navy had several sea-planes trained for the endeavor; Capt. Harry Hawker had landed his British Sopwith biplane parts at Mount Pearl, four miles west of Saint Johns, Newfoundland, already on 4 March. On 5 April Captain Raynham and Major Morgan had left Liverpool, England, with their Martinsyde aeroplane and arrived at Saint Johns, Newfoundland. The British authorities had tested their "dirigibles" and *R-34* was expected to sail very shortly.

On 16 May three United States navy sea-planes (*NC-1, NC-3* and *NC-4*) started from Trepassy Bay, Newfoundland, Europeward with the Azores in view as first landing stage. *NC-4* arrived at Horta, Azores Islands, on 17 May under Commander A. C. Read. He had started from Trepassy at 6:07 P.M. 16 May and arrived at Horta 17 May at 9:25 A.M., having accomplished the distance of 1,200 nautical miles in 15 hours and 18 minutes, at a speed of 81.7 knots per hour. *NC-1,* under Lieut.-Commander P. N. L. Bellinger, got caught in a fog just short of the mark and had to be towed to Horta, where the plane sank. *NC-3,* under Commander J. H. Towers, was at first supposed to have been lost, no word arriving as

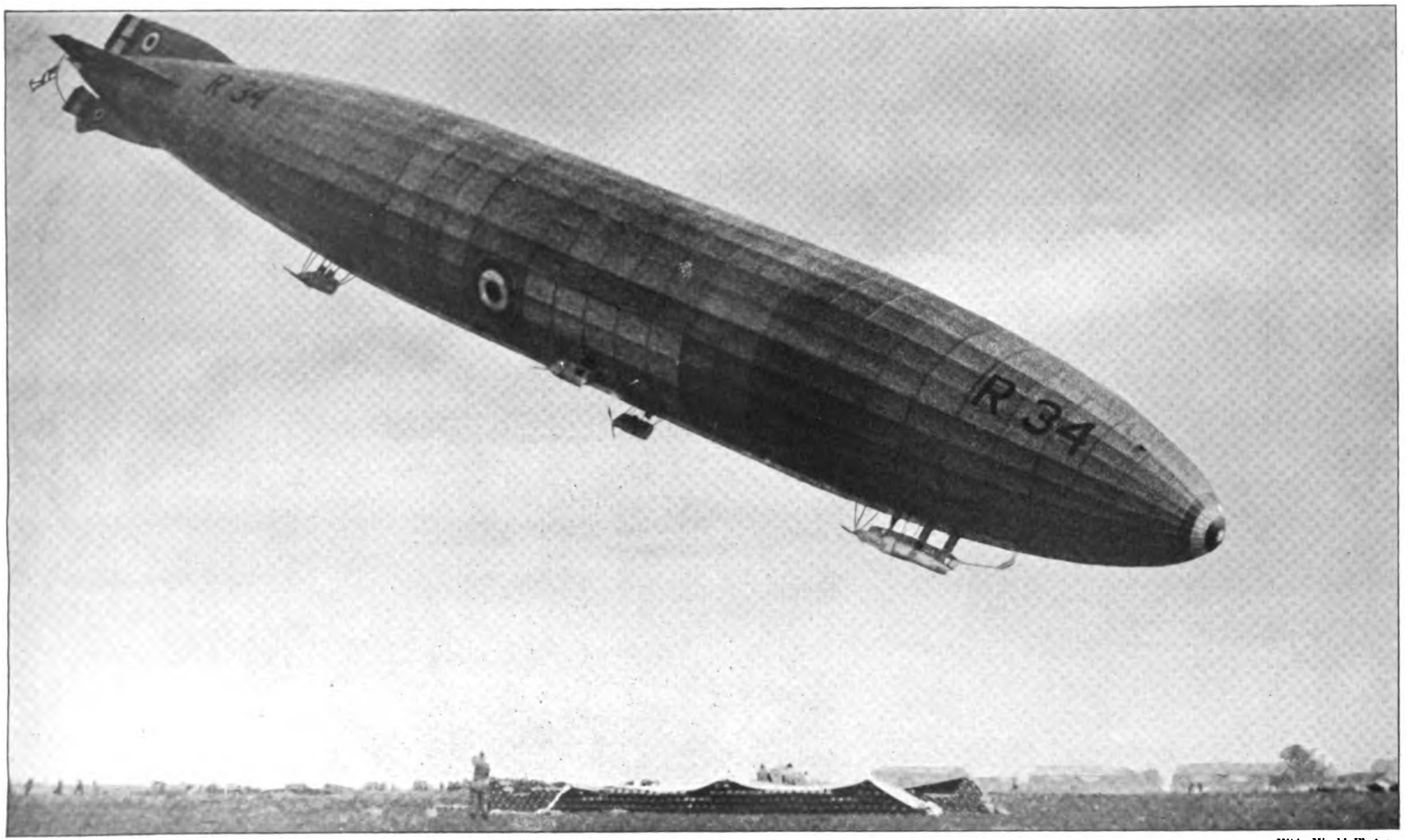
to his whereabouts or existence. But he also had suffered from the fog and, after 48 hours, managed to get to Ponta Delgada under his own power. *NC-4*, on 20 May, continued its flight to Ponta Delgada, leaving at 8:40 A.M. and arriving at 10:24 P.M., accomplishing a flight of 150 nautical miles in 1 hour 44 minutes, a speed of 88 knots per hour; on 27 May the trip from Ponta Delgada to Lisbon was made in 9 hours 43 minutes at a speed of 81.3 knots per hour for the 800 miles; on 30 May Lisbon to Mondego River was negotiated, a distance of 100 nautical air miles, in 1 hour 20 minutes; Mondego River to Ferrol, 220 miles, was the next stage accomplished the same day in 3 hours 7 minutes. On 31 May the final stage, from Ferrol to Plymouth, was accomplished in 6 hours 59 minutes, a distance of 476 miles. Thus the first passage over the Atlantic from the start at Rockaway to Plymouth, a distance of 3,936 nautical miles, was completed in 59 hours 56 minutes flying time. United States destroyers were distributed along the ocean course to give assistance if necessary.

NC-4 Construction.— The extraordinary size of the *NC* flying boats and their general make-up was due to Rear-Adm. D. W. Taylor, chief constructor of the navy. The title *NC* stands for Naval Curtiss and they were constructed for war purposes. The *NC-4* has beneath the flying apparatus a strong seaworthy boat adapted for rough water. The hull is 45 feet long with 10 feet beam. Bottom is a double plank Vee. It is divided by bulkheads into six water-tight compartments, the front one having a cockpit for lookout and navigator. Wings are 12 feet long, weighing but 26 ounces each. There are four Liberty engines of 400 brake horse power per engine and minimum power 1,600 horse power. One of the engines is mounted with a tractor propeller each side of centre line; one engine is mounted on centre line and two others are mounted tandem. The front engine actuates a tractor propeller, the rear engine drives a pusher propeller. It was a new system. Control apparatus was the same as on small aeroplanes. The metal fittings were of special alloy steel, having 150,000 pounds tensile strength per square inch. This permitted much weight reduction. The gasoline tanks (nine of 200 gallons each) were of sheet aluminum, the seams welded; each tank weighed 70 pounds. With its load the machine weighed 28,000 pounds and empty but entire 15,000 pounds. Dimension in length is 60 feet 5½ inches; height 24 feet 5⅛ inches. Personnel of *NC-4* was: Commanding officer, Lieut-Commander A. C. Read; pilots, Lieuts. E. F. Stone and Walter Hinton; radio operator, Ensign H. C. Rodd; engineer, Chief Machinist's Mate E. S. Rhodes.

On 18 May Capt. Harry Hawker with McKenzie Grieve, R.N., as pilot, left Saint Johns with their *Sopwith* and were forced to alight, through engine trouble, in the ocean 1,000 miles east of their starting point and 900 miles from Ireland, their attempted landing point. They were given up as lost for days, but a Dutch tramp steamer picked them up in a sinking condition and landed them. Their plane followed the well-known design of the Sopwith war planes. It had 4 feet width, 31 feet length, tested flight duration 24 hours at 100 miles per hour. Engine was Rolls-Royce developing 375 horse power at 1,800 revolutions. Propeller was four-bladed and geared to 1,200 revolutions. Machine weighed 6,000 pounds fully equipped for the long flight.

On 14 June at 12:13 P.M., New York time, Capt. John Alcock and Lieut. Arthur Brown, pilot, started in their Vickers "Vimy" bomber plane from Saint Johns, Newfoundland, and landed at Clifden, Galway, Ireland at 4:40 A.M. next day, New York time. Mistaking from their height a bog for a green grass land surface, they nearly wrecked their machine on landing, and it buried itself up to the axles and then toppled over on its side. The brave passengers were rescued by landsmen. They had navigated the Atlantic for the first time in a non-stop passage. The wonderful flight was 1,960 miles, and it was completed in 16 hours 12 minutes at the average speed of 120 miles per hour. They had reckoned on the advantage of a full moon, but dense fog and mist obscured both moon and stars for 14 hours, making the voyage doubly perilous. The air was so cold it caked the instruments with ice. Soon after the start the wireless radio apparatus got loose and blew away and their receiver was unable to receive messages either because of "static" conditions. Hence these two brave bird-men and the world were dead to each other 16 hours, adding much to the anxiety of all. But the $50,000 prize offered by the London *Daily Mail* for the first non-stop passage was earned as well as the national greeting. The Vickers "Vimy" plane was motored by two Rolls-Royce engines and was built for bombing. Its wing was 67 feet 2 inches. Length over all was 42 feet 8 inches; gap, 10 feet; chord, 10 feet 6 inches. Gasoline capacity was 870 gallons, weighing 6,000 pounds. The two Rolls-Royce Eagle 375 horse-power engines were carried between the upper and lower planes either side of the fusilage. The strength of the "Vimy" is brought about by hollow seamless tubing in its construction. It had a double under carriage equipped with two-wheel chassis beneath each engine. Entirely equipped full weight was 13,000 pounds.

R-34 Flight.— July 5 Com.-Maj. G. H. Scott, R.A.F., completed his non-stop flight, on the dirigible balloon airship *R-34*, across the Atlantic Ocean by landing at Roosevelt Field, Mineola, Long Island, N. Y. It took 108 hours 12 minutes in its passage from East Fortune air station, near Edinburgh, Scotland. Air distance traveled (as per log) was East Fortune to Trinity Bay, Newfoundland, 2,050 nautical miles (2,357 statute miles); Trinity Bay, Newfoundland, to Roosevelt Field, 1,080 nautical miles (1,242 statute miles), a total of 3,130 nautical miles (3,559 statute miles), regardless of drift from powerful winds. Headwinds and thunderstorms rocked her and lifted her 800 feet one time. Wind was sometimes 50 miles per hour. Shortly before ending her voyage the wind obstructions had so nearly exhausted her fuel as to cause her to send radio calls for additional gasoline, but the wind veered and it became unnecessary. Personnel: Maj. G. H. Scott in command; Capt. G. S. Greenland, first officer; 2d Lieut. H. F. Luck, second officer; Brig.-Gen. E. M. Maitland, executive officer;



Wide World Photos

Arrival of the R-34 at Hempstead, L. I.

Lieut.-Comdr. Z. Lansdowne, United States navy; Maj. G. G. H. Cooke, navigating officer; Lieut. Guy Harris, meteorological officer; 2d Lieut. R. D. Durrant, wireless officer; W. O. W. R. Mayes, coxswain, besides 11 warrant officers and men, six riggers, two wireless operators and a stowaway (Ballantyne), who had been formerly a rigger with the crew and refused to be left behind After several days' stay at Mineola *R-34* returned across the ocean to England (her second passage) without remarkable incident.

R-34 Construction.— The dirigible was of rigid Zeppelin type, built from designs of William Boardmore and Company, Ltd., Glasgow. The machinery was built and installed by Sunbeam Motor Car Company, Ltd., Wolverhampton. She was launched 14 March 1919. Capacity was 2,000,000 cubic feet in 19 gas bags. Length over all, 920 feet. Gross lift, with 95 per cent hydrogen at 15° C. and 760 millimeters barometic pressure, 68 tons. Total horse power 1,375. Speed average, 75 miles per hour. Framework was constructed on longitudinal and transverse lattice girders of duralumin built from three-corner rails and X-shaped pieces. An A-shaped keel at bottom of the hull furnished passage between the cars. The keel contained 81 gasoline tanks of 71 gallons each and storage room for supplies. Sleeping was in hammocks suspended from main ridge of keel. Weight, by tons, carried was: Gasoline (4,900 gallons), 15.8; oil, 0.9; water ballast, 3; crew and baggage, 4; spares, 0.2; drinking water, 0.42. Total, 24.32 tons. Radial wire trusses braced the hull athwartship at the transverse frames, forming the partitions for the 19 gas-bags. Tail planes were horizontal and vertical fins and hinged flaps for steering and elevating. There were four suspended cars: the forward gondola was largest and divided into a navigating room, radio cabin, forward engine-room. The latter contained a Sunbeam Maori-4 engine. The elevating and steering wheels were located in the navigating-room, together with all the navigation instruments (gas-pressure gauges, gas thermometers, level indicators, etc.). There were two small «wing-cars» attached amidships to act as engine-rooms, the after gondola acting in the same capacity. The wing-cars each was equipped with a Sunbeam Maori-4 engine and drove 16-foot propellers (as did the forward engine). The after gondola, of much larger size, had two Sunbeam Maori-4 engines and mounted tandem drove a 19½ foot propeller with either one or both engines. The Sunbeam Maori-4 engines were of special design with 12 cylinders in double row of six each in V-form at an angle of 60 degrees. Cylinders were 110 millimeter bore, 135 metre stroke. The wireless apparatus was 12,000 miles transmission range.

TRANS-MISSISSIPPI EXPOSITION, a popular exhibition of commercial and agricultural products held in Omaha, Neb., from 1 June to 1 Nov. 1898. The exposition covered about 200 acres. There were over 20 buildings artistically grouped and connected by vine-shaded arcades; the main buildings alone having an aggregate floor space of 500,000 square feet, exclusive of 200,000 square feet of gallery space. The exposition was a great success, industrially and financially, the total number of visitors being 2,613,374, and the total cash receipts $1,761,364.18, giving a surplus of $400,000.

TRANS-SIBERIAN RAILWAY, an extensive railroad system of Russia, between Petrograd, Port Arthur (q.v.) and Vladivostok (q.v.), a distance of 5,500 miles across both European and Asiatic Russia. The government of the tsar as far back as 1870 began to plan this great railway enterprise, realizing the possibilities of developing her vast territory to the eastward. Beginning at Moscow the work of building the railroad was rapidly extended and Orenburg was reached in 1877. In 1880 the bridge over the Volga was built and the section connecting the Volga and Obi River basins was begun. In May 1891 the first work on the real Trans-Siberian Railway was begun. From that date the railway was steadily pushed forward. In perfecting this vast enterprise Russia sent commissioners to the United States to study the American railway systems. She imported Italian workmen who had helped to build the Simplon and Saint Gotthard tunnels for the construction work. She built towns in the desert and transported whole families by the thousand to them for the work. Finally the line of track extended from her ancient capital of Moscow in the West to her newest stronghold, Port Arthur, in the East, a direct line of communication — save only for one piece, the Lake of Baikal. This lake is large and frozen nearly half the year. At first it was traversed by boats, but in 1905 a line of rail was laid around its southern end. The line as a single-track railway was completed in 1902. It is 5,500 miles long and cost $175,000,000. The entire system from Moscow to Port Arthur was built cheaply, with light rails and wooden bridges, and it was impossible to maintain anything like a desirable speed. The schedule time for passenger trains was long (13½ miles an hour) for the through express trains. During the Russo-Japanese War it became so apparent that the road was wholly inadequate to the needs of the country that constant improvements of roadway and rolling stock were inaugurated.

TRANSCASPIAN RAILWAY, an important line of railway, beginning at Uzna Ada on the Caspian Sea and extending as far as Merv in 1886, Samarkand in 1888, and to Tashkend and Andijan in 1900. The Amu-Darya (Oxus) is crossed by a wooden bridge 6,804 feet in length.

TRANSCAUCASIA, trans kâ-kā'sĭ-a, Russia in Asia, the region extending between the Caucasus Mountains on the north and Turkey in Asia and Persia on the south. The provinces on both sides of the Caucasus, with the added Armenian districts, constitute Caucasus or Caucasia in the widest sense, and before the empire was broken up were under one central authority, with 11 minor provinces; but the territory is sometimes divided into North Caucasus, Transcaucasia and Armenia. It includes the famous Baker oil region. The chief town is Tiflis. Transcaucasia comprises eight provinces; total area, 95,500 square miles; pop. about 7,500,000.

TRANSCENDENTAL PHILOSOPHY, that type of philosophy which holds understanding to be the creative activity in the real world. To understand the use of the term transcendental during the past century, we must refer back to Kant and his distinction between transcendental and transcendent. Kant applied the term transcendent to such ideas as he believed were beyond the range of any possible experience. On the other hand, he designated as transcendental those elements which were necessary constituents of experience, but which could not come from sense-perception. These transcendental elements are the organizing principles or concepts which are the inherent property of the mind as an active understanding. Such organizing principles could never be furnished by sensation; for it is only by their agency that the material of sensation is built up into a comprehensible experience. Thus Kant maintained that the world of actual experience as far as its form is concerned is the result of the logically necessary structure of our minds, and consequently that this world is formed according to the laws of thought. Just because it is such a thought-construction Kant did not believe that the world of our experience had true reality. This true reality, he affirmed, exists beyond the world of experience and we can know nothing of it except its existence. Thus for Kant the transcendental represented that activity of understanding which is instrumental in the construction of human experience, but not in production of reality. Kant's successors of the Idealistic School (Fichte, Schelling and Hegel) rejected his theory of an ultimate reality beyond experience, and held that the true and only reality was given within the unity of experience. Since the world of experience is formed according to the active principles of understanding, these transcendental principles become, in this case, active not only in the construction of experience, but also in the construction of reality. Thus in the first half of the last century, transcendental acquired a broad and important meaning, signifying in general, a spiritual interpretation of the universe, and more strictly, that philosophy which affirms the activity of reason or understanding in the nature and development of reality. Chiefly through the writings of Coleridge and Carlyle, the ideas of Kant and his successors were made known in England. Through the same medium the transcendental philosophy became known to America and inspired a definite movement in New England. This movement, called New England Transcendentalism, was a reaction from the prosaic orthodoxy and utilitarianism of the time toward a deeper and more ideal interpretation of reality. W. E. Channing and Ralph Waldo Emerson (qq.v.) were prominent in the inauguration of this movement; and there became associated in it a remarkable coterie of congenial spirits. The Transcendental Club, founded in 1836, and Brook Farm (q.v.), a social community organized in 1841, were immediate results of the movement. The first literary organ of the school was the *Dial,* founded in 1840. The *Journal of Speculative Philosophy,* founded in 1871, and the Concord School of Philosophy (1879) were later expressions of the same. The philosophy of this school was not systematically set forth, nor was it derived wholly from German sources. It was an idealism, rather vague, and often incoherent, which owed almost as much to the philosophy of Plato and the Neo-Platonic mysteries as to modern thought. Abolitionism and philanthropy owe much to the New England Transcendentalists. See ALCOTT, A. B.; HEDGE, F. H.; OSSOLI, SARAH MARGARET FULLER, MARCHIONESS; RIPLEY, GEORGE and THOREAU, H. D.

Bibliography.— Caird, 'Hegel' (Philadelphia 1883); Carlyle, 'Sartor Resartus'; Coleridge, 'Biographia Literaria'; Emerson, 'Essays'; Frothingham, O. B., 'Transcendentalism in New England' (Boston 1876); Kant, 'Critique of Pure Reason.'

TRANSEPT, *in architecture,* the transverse portion of a church of which the ground-plan is in the form of a cross; that part between the nave and the choir which projects externally on each side and forms the short arms of the cross in the general plan.

TRANSFER PAPER. See PAPER.

TRANSFIGURATION, Feast of the, a festival on 6 August, instituted in honor of the Transfiguration of Christ. It is said to have been instituted in the West by Pope Calixtus III (1455–58), but is mentioned in the 9th century.

TRANSFIGURATION, Sisters of the. See ORDERS, RELIGIOUS.

TRANSFORMATION. See MYTHOLOGY.

TRANSFORMER. See ELECTRICAL TERMS.

TRANSFORMER, Step-down. See ELECTRICAL TERMS.

TRANSFORMER, Step-up. See ELECTRICAL TERMS.

TRANSFUSION, *in medicine,* the operation of transferring blood (defribrinated) from a receptacle to the vein of a patient — indirect or mediate transfusion; the transmission of blood from the vein of the giver to that of the patient — direct or immediate transfusion; also the intravenous or subcutaneous introduction into the body of any substance, as saline solution, etc. The transfusion of blood from the veins of one living animal to those of another, or from those of a man or one of the lower animals into a man, is a very old operation, having been first performed in 1492. Although it has been used many times with success in restoring the vigor of exhausted subjects, it has frequently failed, owing to the injection of air, the too rapid distention of the heart, phlebitis, thrombosis and embolism. Blood-transfusion has been mainly used in cases of exhaustion from hemorrhages. In recent years the tendency among medical practitioners has been to substitute the injection of normal salt-solution for that of blood. It seems to be proved that "for efficiency, freedom from danger and ease of administration the subcutaneous injection of normal salt-solution, six drams of sterilized salt to one gallon sterilized water, at a temperature of from 110° to 120° F., excels any and all things that have ever been used to relieve those suffering from shock and from the effects of hemorrhage, and as an eliminant in septic and toxic conditions." The possible dangers at-

tending the intravenous injection of normal salt-solution are those of blood-transfusion; but «when life is almost extinct and the patient's vitality so low that the probability of absorption from the subcutaneous spaces is slight, or where the tissues are œdematous, then the solution should be injected into a vein.»

TRANSFUSION, Blood. See BLOOD TRANSFUSION.

TRANSIT CIRCLE. See MERIDIAN CIRCLE.

TRANSIT INSTRUMENTS. See ASTRONOMY.

TRANSIT OF VENUS. See VENUS.

TRANSITION ROCKS. See PALÆOZOIC.

TRANSITS. The passage of a heavenly body between the observer and another more distant body of larger apparent surface is called a transit. The most frequent phenomena of this kind occur in the case of the satellites of Jupiter. The latter is many times larger than any of its satellites and it happens very frequently that an observer with a good telescope can see the passage of a satellite of Jupiter passing over the disc of the planet. The times of these transits are predicted in the astronomical ephemeris. The transits of the inner satellites occur at nearly equal intervals of one day 18½ hours, and it takes about 2 hours and 27 minutes for the satellite to cross. The transit can be observed only when Jupiter is above the horizon and the sun below it, so that only about one transit in five is visible at any one place. Since the satellite is an opaque body, it casts a shadow which may be thrown upon the planet. To an observer on the latter, if the shadow passed over his position, there would be a total eclipse of the sun. The shadow appears to us as a small dark spot passing over the planet near the position of the satellite.

The satellites of all the other planets are either too small or too distant to admit of their transits being observed. For the most part they are entirely obliterated to our sight by the brilliant light of the planet itself when they approach the latter.

The planets Mercury and Venus, having orbits inside that of the earth, will be seen in transit across the sun whenever they pass in a direct line between the earth and sun. If the planes of their orbits coincided with the ecliptic, this would happen at every inferior conjunction of the planet. But, as a matter of fact, there is a certain inclination of each of the orbits to the ecliptic. Imagining the latter plane to surround the sun, extending out to the earth, the orbits of the inferior planets each intersect this plane at a small angle at two opposite points. The line adjoining these points passes through the sun and is called the line of the nodes. If, when the planet is in inferior conjunction, the earth happens to be on or near this line, a transit of the planet will be seen across the sun's disc. In the case of Mercury the earth passes the line of nodes about 8 May and 10 November of each year. It is only within a few days of these times that transits of Mercury can be seen. When such a transit does occur, we must generally wait several years before there is another. The interval between those which occur in November is generally 7 to 13 years. The interval between the transits which occur in May is generally 13 or 20 years. The following is a list of the transits of Mercury for the 20th century with the Greenwich mean time of the middle of the transit:

Year	Date	Greenwich mean time
1907	Nov. 14	0 h.
1914	Nov. 7	0
1924	May 7	14
1927	Nov. 9	18
1940	Nov. 11	11
1953	Nov. 14	5
1957	May 5	13
1960	Nov. 7	5
1970	May 8	20
1973	Nov. 9	23
1986	Nov. 12	16
1993	Nov. 5	16
1999	Nov. 15	9

The earth passes the line of nodes of Venus on 6 June and 6 December of each year. But it very rarely happens that Venus is so near the node on these dates that a transit will be seen. Accordingly the transits of this planet occur at much longer intervals than those of Mercury. For many centuries past and to come there are four transits in every 243 years. The condition which governs their recurrence is that 13 revolutions of Venus require almost exactly eight years. The result is, when Venus and the earth happen to pass a node at nearly the same time, they will both pass nearly the same point eight years afterward. But at the end of the second interval of eight years the conjunction will occur so far from the node that no transit will be visible. The result of this is that the transits occur in pairs, eight years apart. The interval between the last transit of one pair and the first of a pair following is either 105½ years or 121½ years. The dates of these transits for several centuries past and to come are as follows:

1631 December 7	1882 December 6
1639 December 4	2004 June 8
1761 June 5	2012 June 6
1769 June 3	2117 December 11
1874 December 9	2125 December 8

It will be seen that the whole 20th century will pass away without the inhabitants of the earth having an opportunity to observe this phenomenon. But the approach of the transits of 2004 and 2012 can be watched in thought through successive cycles of eight years. An inferior conjunction of Venus occurred on 8 July 1900. At that time the earth, having passed the node on 5 June, was 34 degrees distant from it. In consequence, there was no transit, but Venus, could it be visible so near the sun, would have been seen passing below the sun. Eight years later the same thing will repeat itself, only the conjunction will take place between two and three days earlier, namely, on 5 July 1908, the earth being between two and three degrees nearer to the node than it was on 8 July 1900. The conjunction will go on repeating itself in 1916, 1924, etc., two or three days earlier at each repetition and a little nearer to the node, until 2004, when there will be a transit. At the conjunction of 1908, the earth will be on the opposite side of the node, but

near enough to it for another transit. Then there will be no more transits for more than a century.

Transits of Venus derive their astronomical celebrity from the belief entertained in former times that they afforded the best method of measuring the distance of the sun from the earth. The measures were made by the principle of parallaxes. An observer, as far north as he could station himself to observe the transit, would see Venus pass over the sun's disc on a line apparently further toward the south than an observer who was in the Southern hemisphere. The comparison of the observations made by observing the times which, at each station, it took Venus to complete its transit, afforded the means of calculating the parallax and the distance of the sun. The feasibility of doing this was pointed out by Halley about the middle of the 17th century, and, on his proposal, expeditions were sent by various nations to points in the Northern and Southern hemispheres to observe the transits of 1761 and 1769. This was a period of great unrest, and several of the expeditions became celebrated through the adventures to which they gave rise. In 1769 Mason and Dixon, the English astronomers, started on a ship of war for their station in the Southern hemisphere, but were attacked by a French frigate and were compelled to return to port after a severe battle. The king of Denmark sent Father Hell, a Jesuit astronomer of Vienna, to a point near the North Cape, where very successful observations were made. But doubts were thrown on the genuineness of his record, which were not settled for more than a century. The transit of 1769 was visible in the Atlantic States and observations upon it were made under the auspices of the American Philosophical Society, held at Philadelphia. The most celebrated of the Philadelphia observers was David Rittenhouse.

When the observations of these transits were worked up, it was found that they would not give so certain a result as was anticipated. No two observers seemed to agree as to the exact moment at which Venus had entered wholly upon the disc of the sun. The entrance was not seen in the sharp and precise way it should be seen, but seemed to be uncertain, through a dark haze forming on the two limbs at the moment when Venus was entering. The outcome of the affair was that it was more than 60 years after the last transit before a result had been worked up from it which was supposed to be quite satisfactory. This was done by Encke in 1822. The distance of the sun which he derived was, in round numbers, 95,000,000 miles. This distance appeared in all astronomical textbooks and was almost uniformly accepted for 30 years.

Then it was found by Hansen and others that there was something wrong in this determination and it was claimed that the distance was more than 3,000,000 miles less than Encke had found it. The methods of making this determination are stated in ASTRONOMY, THEORETICAL. It has since been shown very clearly that a great error did really exist in Encke's determination, though it was not so great as had at first been supposed.

Notwithstanding this failure of the method, it was supposed that with the greatly refined telescopes and better means of observation of recent times, the transits of 1874 and 1882 could be utilized advantageously in the same way. Accordingly, on each of these occasions, expeditions, fitted out with the best instruments that science could provide, were sent by various nations to the best stations for observation in various parts of the world. But when the observations were worked up, the results were again found to be unsatisfactory and the observations turned out to be more useful for determining the position of Venus, and the slight change from century to century of its node, than for determining the distance of the sun.

SIMON NEWCOMB.

TRANSMIGRATION OF THE SOUL, or **METEMPSYCHOSIS,** the belief of many races and tribes at all times, to the effect that the soul after the death of the body passes into the bodies of the lower animals or other human bodies, or, it may be, of plants or inanimate objects. Among various tribes of Africa and America the belief is found entirely unconnected, so far as can now be discovered, with any ethical notions. In the teaching of the Brahmanic Hindus, among whom the doctrine can be traced further back than in any other race, it has its foundation in the belief of the connection of all living beings and of the gradual purification of the spiritual part of man and its return to the common source and origin of all things — God. By some the migration of a human soul through various bodies is regarded partly as a penance and partly as a means of purification. E. B. Tylor says in 'Primitive Culture,' that "the theory of the Transmigration of Souls, which has indeed risen from its lower stages to establish itself among huge religious communities of Asia, great in history, enormous even in present mass, yet arrested and as it seems henceforth unprogressive in movement; but the more highly educated world has rejected the ancient belief and it now only survives in Europe in dwindling remnants." Probably the greatest intelligence who believed in metempsychosis was Plato. The doctrine was and is common in Asia and was accepted by some of the early Christians, and there are suggestions of it in the Kabbala.

Pythagoras is the first Greek philosopher in whose system the doctrine occupied an important place, but Thales and Pherecydes are both said to have preceded him in teaching it. Plato in his 'Phædo' advances some probable arguments in favor of the doctrine, propounding the speculation that souls return into the Godhead after a cycle of 10,000 years, during which they have to abide in the bodies of animals and men. Plotinus treats of two kinds of transmigrations, a passage of souls from invisible ethereal bodies into earthly ones and from earthly into other earthly bodies. Among the Romans, Cicero alludes to this doctrine, and Virgil, and more especially Ovid, in many passages give it a poetical treatment. Cæsar informs us that it was believed in by the Gauls, who, he says, in this faith were able to despise death. The doctrine is also found in the Talmud, but only a minority of the Jewish rabbis appear to have adopted it. They treat the sub-

ject of transmigration in their peculiar way, maintaining that God created but a certain number of Jewish souls, which, therefore, constantly return on earth as long as Jews are to be found here and are sometimes made to dwell in the bodies of animals for the sake of penance, but at the day of the resurrection will all be purified, and in the bodies of the just revive on the soil of the promised land. The doctrine of the transmigration of souls has also been held by various Christian sects, for example, by the Carpocratians, Valentinians and Manichæans. It was also professed by the Arabs before Mohammed, but was not admitted by him into the Koran. Even some modern European writers have inclined to this doctrine. Among these may be mentioned Lessing in Germany and Pierre Lerou and Jean Reynaud in France. The reasoning of Lessing in support of the doctrine amounts to this, that the human soul can acquire the infinite conceptions of which it is capable only in an infinite series of successive existences, that the soul in one condition may supply the deficiencies of another, and thus gradually fit itself for a perfect life.

He thus appears more of a reincarnationist, and this emphasizes a distinction that many lose sight of. Reincarnation and transmigration are not at all identical. Obviously all human intelligences have a conscious ego which the majority conceive to be an immortal soul. Whatever we call it, we have something that raises us above the animal body which we inhabit. This soul or ego comes from somewhere or is created when each of us is born. Inasmuch as some souls very early show vast abilities and others are very dull and stupid, the assumption that the wise souls have lived before is not irrational. This being granted, we have our choice of two momentous but quite different theories. Transmigration supposes that the soul at death goes into another body, perhaps the body of a beast if punishment is deserved, perhaps is born into a wealthy and brainy family if reward is deserved. Reincarnation, as generally taught and accepted by Theosophists, is but one day in a larger life; it propounds that as individual souls die here they pass a time on the higher planes, and are then reborn to acquire further experiences, advancing or evoluting from the lower to the higher. This is an extension of the idea of evolution and far more reasonable than the transmigration doctrine. Many, therefore, regard transmigration as a mere corruption of the rational theory of reincarnation. Consult Besant, A., 'The Self and Its Sheaths' (1895); Sinnett, A. P., 'Esoteric Buddhism' (1883); Berthalet, A., 'Transmigration of Souls' (1909); Moore, G. F., 'Metempsychosis' (1914); Muller, Max, 'Six Systems of Indian Philosophy' (1899).

TRANSMISSION OF POWER, Long Distance. See ELECTRIC TRANSMISSION OF ENERGY; POWER TRANSMISSION.

TRANSPADANE (trans-pā'dān) **REPUBLIC.** See CISALPINE REPUBLIC.

TRANSPIRATION, *in physics and chemistry,* a name first applied by Graham (in 1846) to the phenomena that are observed when a gas discharges into a vacuum, through a capillary tube, and since extended so as to include the passage of any kind of a fluid, whether gaseous or liquid, through a capillary tube, from a region where the pressure is high, to one where it is low. The laws governing the transpiration of fluids are imperfectly known. They are quite different from those that govern diffusion phenomena, and also different from those that hold in the case of the *effusion* of gases through a minute hole in a thin partition. In transpiration, the viscosity of the fluid appeared to be the chief factor in determining the quantity of fluid traversing the tube in a given time. The temperature of the fluid is also of much importance. Water, for example, will transpire through a given tube two and a half times as rapidly at 113° F., as at 41° F., the conditions of the experiment being supposed to be identical in all respects save as to temperature.

TRANSPLANTING, the process of establishing plants in new quarters, is one of the most important operations of horticulture, agriculture and forestry since it permits large numbers of plants to be grown during their early stages in very restricted areas, thus economizing space and the labor entailed in their cultivation until they are able to care for themselves. The operation is, therefore, in constant use in greenhouses, nurseries, etc., where it occupies a very large part of the time of the workers. And for forestry work hundreds of thousands of seedling trees are transplanted annually.

The operation may be performed at any season provided proper care is exercised in manipulation. But there is with each species of plant a season at which success is more certain than at others. With evergreens this season is in the spring just before growth starts; with deciduous subjects the autumn, after the leaves have fallen, is often as good as the spring, but a great many deciduous plants may be transplanted during the growing season. Usually, and upon large scale operations, however, only small herbaceous plants are transplanted while in active growth and then only when prepared for such operation by being grown in gardens or beds with this end in view. Such preparation is necessary since the operation, so far as the plant is concerned, is always violent because, even when most carefully performed, large quantities of the roots are destroyed and these losses are the greater as the plants are larger and more firmly established. Hence, the smaller the plant when removed, the more likely is it to become re-established. Trees, shrubs and herbaceous perennials which have not become active in the spring or have ceased activity in the fall are less likely to suffer because their active roots have either not formed, as in the former case, or have ceased to act in the latter. The plants should always be removed with as much of the root-system as possible, be exposed to the air and sun as short a time as possible and replanted in soil at least as moist as that from which they have been taken; if more moist, so much the better. By soaking the soil deeply around each plant it is possible to transplant strawberries and other plants successfully even while the ground is powdery dry in midsummer. Since the loss of feeding roots will curtail the supply of water

absorbed, the leaf surface must be reduced considerably. In many instances one-half is considered satisfactory, but with fruit trees, vines and ornamental shrubs, two-thirds or even more is frequently cut away from the tops. This top pruning is preferably done after the plants have been set, because any injured twigs may then be removed and there is then less danger of injuring the buds which are counted upon to form the new tops. Always the soil should be pressed firmly about the roots, the larger subjects being made firm by tramping the soil down hard with the feet.

Many factors exert an influence upon transplanting. In arid regions, and in places where the winds are dry or prolonged, the operation is less successful than where reverse conditions prevail. Plants which have tap-roots cannot usually be transplanted successfully after they have once become established; hence, the necessity of transplanting them when very small and the advisability in many cases of cutting off the tap-roots by means of root pruning tools which go beneath the plants while still growing in the nursery rows. Instead of this method plants and others that are slow to produce roots are often transplanted several times in the nurseries to develop more extensive root-systems near the surface. Stocky plants almost invariably give better results than attenuated or weak ones, and plants which have been inured to the temperature of the outside air succeed where plants not so "hardened-off" from greenhouse or hotbed conditions will almost invariably fail or suffer serious check. The weather at the time of the operation is also an important factor. If cool, cloudy or showery weather succeeds the transplanting, the chances of success not only in the operation but in the crop (if the plant is an economic) are greatly enhanced, and if the soil be freshly prepared so much the better. Except in dry weather it is inexpedient to water newly set plants; but when this is done water should be given in abundance at the base of the stem, and after it has soaked down the surface should be pulverized to hold the moisture in the soil. The watering is best done in the evening and the pulverizing in the morning.

For the transplanting of cabbage, tomatoes, sweet potatoes, strawberries and other field-crops special machines have been devised. They usually consist of a furrow-maker, a distance-indicator, a plant-setting device, a tank for watering the individual plants as set, and two seats for the boys who place the plants alternately as needed. The whole is mounted on wheels and drawn by a pair of horses. The position of the next row to be planted is indicated by a marker. These machines are widely used and have been found to do excellent work with great rapidity and economy. The "misses" and failures are surprisingly small in number. They are economically filled by hand.

The transplanting of large trees is frequently practised for producing quick effects in parks and private estates. The subjects chosen are always such as have grown remote from other trees, first because the labor of cutting roots is less, and second because the tree is more shapely. Trees which have grown in groves and forests are rarely selected because their trunks are frequently too long, and have to be easily handled to be sightly when transplanted as isolated specimens. The lower and the more bushy the top the better, because the mechanical appliances required are less powerful and costly and because the necessary pruning of the top after setting can be done with least injury to the form of the tree. If such trees may be obtained from shallow soil, so much the better, because the roots will then be near the surface. Trenches are dug as far away from the trunk as seems advisable, with large specimens 15 feet or more radius is common. When the work is done during the growing season the roots exposed are wrapped with wet moss, straw or similar material and burlap. They are wrapped and tied to the trunks for ease of handling in transit. The tree is lifted upon trucks after the excavation beneath it is complete and the ball of earth with the roots is transported to new quarters. In winter work with large trees the trenches are dug if possible in the fall and the tree with its ball of earth lifted when frozen. The practicable limit of weight for such specimens seems to be about 30,000 pounds. Such specimens of maple, elm and other hardwood trees have a diameter of about two and one-half feet. When being set in its new position the earth should be shoveled in gradually after the roots are in place and abundant water be applied to ensure the complete filling of every cranny. Tamping the soil around the roots with small rods is also widely practised. It is doubtful if such operations are in the long run entirely satisfactory when considered in the light of the expense, but as in the case of ordinary transplanting necessity demands them. Consult Bailey, 'Standard Cyclopedia of Horticulture' (New York 1914–17).

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TRANSPORT, a ship or vessel employed by a government for carrying soldiers, war stores or provisions from one place to another. At the beginning of the Spanish-American War the United States had no ships of this class. A number of coastwise craft were purchased and hastily transformed into transports on which troops were shipped to Manila and other points. When the war closed the United States government fitted up a number of these vessels as model transports. In the war between Russia and Japan in 1904, the Japanese transported almost their entire army to Korea; some of her expeditions requiring as many as 100 transport ships for this purpose. When the United States declared war against Germany in 1917, it was almost wholly without efficient transports, for all available vessels had been put into service transporting freight, there being a reduced supply of ocean-going vessels. The first step of the United States government, therefore, was to overhaul the German ships that had been interned in Hoboken, and fit them for transport service. The government then bought all available merchant craft, which were few, and started its immense shipbuilding program, which was one of the wonders of the war. (See SHIPBUILDING). The United States transports sailed regularly from various ports, always unannounced, and so effectively guarded that there were very few losses in landing millions of troops in France.

TRANSPORTATION, (1) a punishment formerly awarded in Great Britain for crimes of a serious description, but not entailing the penalty of death. It varied in duration from seven years to the term of the criminal's life, according to the offense. The convicts were sent to Australia, Tasmania and Norfolk Island. In 1857 transportation was superseded by penal servitude, but it was only in 1868 that transportation to western Australia actually ceased. (2) A general name for the movement of passengers or freight from one point to another, by rail, road or water. Transportation will be found fully treated in various articles under RAILWAYS: AMERICAN MERCHANT MARINE; COMMON CARRIER; STEAM VESSELS.

TRANSPORTATION OF SCHOOL CHILDREN. See EDUCATION, RURAL.

TRANSUBSTANTIATION. The real substantial presence of the body and blood of Christ in the Eucharist is one of the fundamental doctrines of the Roman Catholic Church, and the mode or nature of this mysterious presence, which is also a matter of doctrinal belief, is expressed by the technical theological term "Transubstantiation." The word seems to have been first used by Hilbert, bishop of Tours (1057–1134); it afterward became current in the Scholastic period and was solemnly adopted and approved by the Council of Trent (Sess. 13, Can. 2). In controversy exception has been sometimes taken to the term as being unscriptural and relatively new, but the real issue is concerning the doctrine that it serves to express, for if the traditional Catholic belief in the Real Presence be true — belief which was never seriously called in question before the Sacramentarian controversy of the 16th century — it must be granted that considering the system of philosophy according to which the entire scheme of scholastic theology was built up, no more appropriate word could be found to convey the idea than "Transubstantiation." as is shown by the use of the cognate words transformation, transfiguration, etc. Like the words ὁμοούσιος and θεοτόκος which in earlier controversies became famous as epitomizing the specific points of doctrine in dispute, the term "Transubstantiation" embodies the distinctive teaching of the Roman Catholic Church concerning the mystery of the Eucharist. In defining the traditional position on this point against the various new views advocated by the Reformers, the Council of Trent (Sess. 13, ch. 3, 4 and Can. 2)* describes transubstantiation as "the changing of the whole substance of the bread into the body, and of the whole substance of the wine into the blood of Jesus Christ, the appearances of bread and wine alone remaining." This doctrine, as explained by theologians, involves the Aristotelian and scholastic theory concerning the physical nature of bodies. These are supposed to contain two distinct and even, absolutely speaking, separable elements, namely, the underlying substance, and the accidents by which the substance is variously modified (for example, size, shape, weight, color, taste, etc.). Substance, according to the same theory, consists of two essential elements or principles, one passive and indifferent, called the matter (*materia prima*), the other active and determining, called the substantial form. The matter is supposed to be the same in all bodies, and the specific nature and characteristics of each one are determined by its form. Thus, every species of body inanimate or living, including man, has its own substantial form whereby it is specifically constituted, and differentiated from all other species, and when one substance or body is changed into another (for example, wine into vinegar), the process is understood by the Scholastics as the passing away of one form (that of wine) and the succession of a new one (that of vinegar), while the material element which is the subject or basis of the change remains the same. This substantial change is, therefore, technically called transformation. No process of natural change from one thing to another was supposed to involve both elements of substance (matter and form), but such being the miraculous change recognized by tradition and the theological schools in the mystery of the Eucharist, it was aptly termed transubstantiation. According to this doctrine, in virtue of the divine power attached to the words of consecration, the entire substance (both matter and form) of the bread and wine ceases to exist, and its place succeeds that of the body and blood of Christ. The accidents or appearances remain as they were before, but they do not adhere to or modify the body of Christ as they did the substance of the bread; they are sustained miraculously without any connatural subject of inhesion, and in all respects they follow the same physical and chemical laws as if no change whatever had taken place. The body and blood of Christ remain present in these conditions as long as the consecrated species retain the outward appearance and characteristics of bread and wine, but when through deglutition or otherwise these qualities disappear, the Real Presence ceases, and the matter of that substance, which if the process were merely natural would, in the given conditions, have succeeded the bread and wine, is created to meet the exigencies of the new accidents which supervene. Hence the doctrine postulates a real annihilation of matter and a subsequent creation of the same. Besides this the Real Presence thus explained, involves various other miracles, for instance, the multilocation of Christ's body in the Sacrament and its presence in the consecrated particle without the ordinary relations to space — a presence analogous to that of the soul in the body which it animates, but which is not really measured by any corporeal dimensions. In explanation of this the theologians say that Christ's body in the Sacrament retains its internal, intrinsic dimensions, that is, the mutual relation of the different parts to one another, but is deprived of its extrinsic quantity, that is, its relation to other physical objects and surrounding space. The Council of Trent defined transubstantiation as the traditional teaching of the Church chiefly in opposition to the view put forward by Luther, who, while he retained on Scriptural grounds the doctrine of the Real Presence and defended

* The doctrine of Transubstantiation had already more than once been the object of authoritative declaration on the part of the Church, namely, in a council held in Rome under Gregory VII, 1079 A.D.; in the Fourth Lateran Council (1215); in the profession of faith sent by the Council of Lyons to Michael Palæologus (1274); in the Decree for the Armenians which emanated from the Council of Florence (1445), etc.

it against the so-called "Sacramentarians," maintained, however, that the substance of the bread and wine remain after the consecration as before. This theory is called that of "Consubstantiation," a word implying the coexistence in the Sacrament of both the bread and the body of Christ. Another view advanced by some of the early Reformers who rejected the Catholic doctrine, is that of "Impanation," according to which in virtue of the consecration a hypostatical union would be effected between the person of Christ and the bread and wine.

But the specific controversy between the Roman Catholic theologians and the various Protestant sects concerning the *manner* of Christ's presence in the Sacrament has been practically lost sight of, because modern Protestants have for the most part given up the doctine of the Real Presence altogether, and interpret the words of institution (Matt. xxvi, 26–28, and parallel passages in the Synoptics) and other passages referring to the subject in a figurative sense. Many Catholic theologians maintain that even apart from the authoritative interpretation of the Church, the doctrine of Transubstantiation can be proved from the Scripture texts mentioned. In other words, that the idea conveyed by the word Transubstantiation is as clearly contained in the New Testament as the notion expressed by the words *ὁμοούσιος* and *θεοτόχος*, which were the keynotes of the Arian and Nestorian controversies. Others admit that a proof of the doctine, at least as it is philosophically explained, can be educed from the words of institution only by reading into them subtile considerations foreign to the minds of the Apostles and the New Testament writers. Be that as it may, we find that the early Fathers understand these texts as really implying the doctrine of transubstantiation. They do not, of course, use the word or attempt any philosophical explanation of the mystery, but they affirm that contrary to the testimony of our senses, what seems to be bread is no longer such after the words of consecration, but the body of Christ. Thus Saint Cyril of Jerusalem writes: "What seems bread is not bread, though it seems so to the taste, but Christ's body; what seems wine is not wine, though the taste will have it so, but Christ's blood" (Cathech. iv, 9). Similar passages abound in the patristic writings, and that they express equivalently transubstantiation few will deny.

In connection with this doctrine the Council of Trent has defined that in the Eucharist "the whole Christ (body, blood, soul and divinity) is contained under each species (that is, under the appearances of either the bread or the wine), and also under every part or portion of each species, at least after the parts have been separated" (Sess. 13, Can. 3). These two points offer no special difficulty if once the doctrine of Transubstantiation be admitted; it need only be remarked that they exhibit the intrinsic reason why the Catholic Church considers communion under one kind to be sufficient. If priests celebrating mass are obliged to receive under both kinds, it is only because their communion is held to be an integral part of the Eucharist sacrifice for which both species are absolutely required. For other more subtle questions connected with the theory of Transubstantiation as elaborated by the Roman Catholic theologians, together with the explanations whereby it was made to fit in with the philosophical systems of Descartes and Leibnitz, as well as with more recent theories, consult any of the standard manuals of Catholic theology, for example, that of Wilhelm and Scannell (in English), Vol. II, p. 415 et seq. For a criticism of the doctrine from the Protestant point of view, consult Hodge, 'Systematic Theology,' Vol. III, p. 678 et seq.

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TRANSVAAL, trans-väl (now included in the UNION OF SOUTH AFRICA), a British colony in South Africa, bounded on the north by Matabeleland, on the east by Portuguese East Africa and Swaziland, on the south by Natal and the Orange River Colony and on the west by Griqualand West, British Bechuanaland and the Bechuanaland protectorate. The area, previous to 1903, was 119,139 square miles but was in that year reduced to 110,426 square miles by the transfer of some of the southeastern districts to Natal. The land consists in the main of a plateau lying between 3,500 and 5,000 feet above the sea. On the east this plateau is bounded by a northern extension of the Drakenberg, rising to an altitude of 8,725 feet. East of this the land falls rapidly toward the coastal regions of the Portuguese territory. Two main mountain ranges traverse the interior of the plateau; the Witwatersrand forms the divide between the Vaal River, flowing on the southern, and the Limpopo River on the northern boundary. The geological structure consists of granite and slate covered by the Cape formation of standstone, slates and conglomerates, and in some parts by coal-bearing strata.

The climate is dry, nearly all of the scant rainfall being in the summer months, October to March. The mean maximum temperature is 73° and mean minimum 48°, mean annual 67° F. The western territory has a rainfall of 12 inches, which increases eastward, being 40 inches on the eastern border. Over 2,000,000 acres of land are under cultivation, and 30,000,000 acres are devoted to grazing. There are over 5,000,000 sheep and over 2,000,000 goats. The plateau and mountains are exceedingly rich in minerals, including gold, diamonds, coal, lead, silver, sulphur, cobalt, saltpetre, copper and iron. The gold deposits are foremost in the world. (See TRANSVAAL, GOLD MINING IN THE). In 1916 the production of diamonds, found chiefly near Pretoria, amounted to $28,000,000, and the coal to $6,000,000, copper $3,000,000 and tin $1,650,000. The diamond output in 1913 was valued at $57,000,000, but most of the mines shut down when the war of 1914 began. The climate in the eastern and northern lowlands is tropical; on the plateau it is cooler and very agreeable, but the rainfall is deficient. Forests, chiefly of acacias, are but of small extent. With irrigation the soil would be suitable for all European and sub-tropical agicultural products, but up to the present time there has been very little agriculture, the Boers being chiefly occupied in cattle raising. Railways have been built from Johannesburg to Delagoa Bay, Durban and the Cape ports. The mileage, about 2,500, is being

extended. The principal exports are gold, diamonds, copper, wool, cattle, hides, ostrich feathers, ivory and minerals. The chief imports are provisions, machinery, carriages, automobiles, shoes and clothing. The government is vested in an administrator, an executive committee of four and a provincial council of 36 members. Good schools are maintained; there were 892 in 1916, with an average attendance of 73,000. There are also three normal colleges and 298 native schools, with 20,000 pupils. The capital is Pretoria, and the largest city is Johannesburg (q.v.), with a population of about 120,000. The total population was given as about 1,688,212. Of these 1,219,845 were natives, Kaffirs, Basutos and Bechuanas. Only one-third of the white population were Boers (q.v.), the rest being, previous to the war, termed "Uitlanders." Transvaal was settled by Boers from Cape Colony in 1833–37. In 1856 they adopted a republican constitution, but internal disagreements, unwise administration and troubles with the natives forced the republic in 1877 to consent to annexation by Great Britain. In 1880, however, the Boers rose in arms, with the result that their independence was re-established, subject to British control over external affairs. The discovery of gold brought in large numbers of foreigners, chiefly English, who demanded a voice in the government. After fruitless appeals to Pretoria, and a disastrous attempt at insurrection in 1896 (known as the "Jameson Raid"), the Uitlanders appealed to the British government. After three years of negotiations England, in October 1899, rejected an ultimatum addressed to it by the Transvaal government, which thereupon invaded British territory. The war, in which the Orange Free State threw in its lot with the South African republic, lasted nearly three years. After a series of remarkable initial successes had been gained by the Boers, the two republics were finally occupied by British troops, and their annexation to the British dominions was proclaimed 1 Sept. 1900, although hostilities continued until June 1902. The War of 1914 stimulated manufacturing in the Transvaal, and they now tan their own leather, produce their own cement, beer and matches, besides manufacturing explosives, rope, brooms, brick and earthenware. See SOUTH AFRICAN WAR; TRANSVAAL, GOLD MINING IN THE; UNION OF SOUTH AFRICA.

TRANSVAAL, Gold Mining in the. The Transvaal, prior to 1903, comprised an area of nearly 120,000 square miles, but in that year, by the transfer of some of the southeastern districts to Natal, this area was reduced to about 112,000 square miles, which nearly equals the size of the territory of Arizona.

Besides the famous Witwatersrand there are two quartz-mining districts of some importance, namely, Lydenburg and De Kaap.

The Lydenburg district first attracted attention in 1876, when the alluvial deposits of that section began to be exploited. At a latter period vein-mining was started, and at the present time several companies are operating in that district. The product in 1898 of five companies, running 137 stamps, was 154,560 tons of ore, yielding 108,884 crude ounces of gold (an average of 14.09 dwt. gold per ton) valued at £314,953.

The De Kaap gold-fields were discovered in 1884. In 1898 seven companies, running 200 stamps, produced 89,760 crude ounces of gold, valued at £296,330.

General Features of the Witwatersrand.— This mining district derives its name from the *Witwatersrand*, or "white-waters range," of hills immediately north of Johannesburg. These hills rise from 400 to 600 feet above the general level of the surrounding country, have a general east and west trend, and constitute the watershed of this part of South Africa, their northern slope draining into the Limpopo River and thence into the Indian Ocean, and their southern slope into the Orange River and thence into the Atlantic. This ridge can be traced about 40 miles, and consists of quartzites and inter-stratified schists.

The gold-field lies on the high plateau of the southern Transvaal. In its physical aspect the country bears a striking resemblance to certain parts of Wyoming and Nevada. While perhaps somewhat less regular in its undulations, it is equally destitute of trees other than a sparse growth of shrubs, and in appearance suggests herding and agriculture rather than mining. It is from 4,200 to 6,000 feet above sea-level, to which fact it owes its temperate and mild, indeed salubrious climate, in spite of its semi-tropical latitude. The coastal lands contiguous to the Transvaal are malarial and unhealthful.

The soil of the country is in most localities fertile; but irrigation is generally necessary; and this, owing to the lack of facilities for storing water, is not feasible at the present time.

The Transvaal has a rainy season of four or five months, the heavy rains beginning usually with November or December and continuing until March or April. This is what is known as the summer or warm season. The thermometer rarely reaches 95° in the shade, and the heat is "dry." During the remaining "winter" months (April to September) rain is very exceptional, and there is no extreme cold. Snow is a rare occurrence in the Witwatersrand district. While the climate is remarkably salubrious and invigorating, the district has had in the past a high rate of mortality, by reason of the lack of proper sanitation. Undoubtedly this will be greatly minimized under better government.

The town of Johannesburg (q.v.) lies upon the southern slope, about midway between the east and west extremities of the "banket"-basin, immediately to the north of what is known as the central section of the Rand. This is by far the most important mining section of the gold-field. The Witwatersrand district, in a comprehensive sense, embraces also the outlying districts of Heidelberg and Klerksdorp. Johannesburg is reached by three railway lines from the ports of Cape Town, Delagoa Bay and Durban, the distance by rail being 1,013, 396 and 487 miles respectively.

Historical.— Mining in the Transvaal was prohibited until 1868, at which time the Boer government, being in dire financial straits, threw open the gold-fields to exploration and exploitation by all comers, and even went so

far as to offer a bonus for the discovery of profitable mines in the country. As a result, prospecting in the early '70s led to the discovery of quartz-veins and the inauguration of mining in several parts of the northern Transvaal. In 1885 the conglomerate- or "banket"-beds of the Witwatersrand were discovered. In that year a small stamp-battery was erected to crush the material of a quartz-vein a few miles west of Johannesburg and a crushing of conglomerate was subsequently made in this battery. But it was not until April 1887 that a battery of three stamps was erected to treat the ore of the Witwatersrand "banket." This was followed by the erection of other batteries and the output of gold for that year was 23,000 ounces. The product increased by leaps and bounds, as is shown by the table of production given later.

Mining Titles.—The mining laws of the Transvaal are excellent in character and while the claims cover every square foot of land for an area of nearly 40 miles long by from two to three miles wide there have been practically no conflicts over extra-lateral rights.

Notwithstanding the change in the political status of the Transvaal following the Boer War the main features of the mining law of the South African Republic are retained. The principles of the English common law and the immemorial precedents of English practice uphold present rights according to the statutes in force at the time of their inception. The mine-operators of the Transvaal whose titles were acquired from the Republic are, therefore, secure in the position thus defined; and hence it is not inappropriate in this place to state the Transvaal mining law as it existed prior to the war.

According to that law (1903) the right of mining for and disposing of all precious metals and precious stones belongs to the state; but the state president, with the advice and consent of the executive council, may, by proclamation, throw open government ground as a public diggings, upon which mining claims can be "pegged off" (that is, located) as specified by law.

An owner of a farm may, upon application to the government, have the farm likewise proclaimed. Before the proclamation of a private farm, the owner has the right of allotting to any person or persons he may specify a certain number of claims, called *Vergunning* claims, the number depending upon the size of the farm but not exceeding 60 as a maximum.

The owner has the further right to reserve for himself one-tenth of the ground, which is called a *Mynpacht*. This portion is held by the owner as a lessee, under what is called a *Mynpacht Brief*, for a term of not less than five years nor more than 20 years, with the privilege of renewal. The rental on *Mynpacht* was 10*s*. per *Morgen* (2.11 acres) in 1903.

He may also retain a certain area for residential and farming purposes, called a "*Wer*" or homestead. Finally, the owner of a proclaimed farm is entitled to one-half of all licenses paid to the government.

A reef-claim (lode-claim) is 150 Cape feet (155 English feet) on the strike of the reef by 400 Cape feet (413.2 English feet) in the direction of the dip — about 1.47 acres.

TABLE I — SOUTH AFRICAN LAND-MEASURES.

1 Cape ft.....	=	1.033 English ft.
1 Cape sq. ft....	=	1.067 English sq. ft.
1 Claim.....	=	150 by 400 Cape ft. = 60,000 Cape sq. ft. or 64,025 English sq. ft. = 1.47 English acres.
1 Morgen.....	=	92,196 English sq. ft. = 2.1165 English acres of 43,560 sq. ft.

Prospecting is not allowed on private ground without permission of the owner, but public ground is open to prospectors, though claims may not be pegged out until after proclamation of the ground in question as above described.

For a prospecting license on proclaimed private ground there is a charge (1903) of 5*s*. per month per claim, half of which goes to the owner and the rest to the government. On government ground the similar charge is 2*s*. 6*d*. per month, which goes to the government.

When, in the judgment of the mining commissioner, the results of the exploration justify the step, he may convert the prospecting licenses into a digger's license, after which a charge of 20*s*. per claim per month is made, provided ore from the property is being crushed. If, however, no ore is being extracted and crushed from the claim, the charge for the digger's license is 15*s*. per month.

In 1896 the receipts from prospecting licenses amounted to £620,000; from diggers' licenses, £61,000, and from machine-stand licenses, £59,000.

Financial Conditions.—At the outbreak of the South African War the total capitalization of the gold mines of the Witwatersrand was over £70,000,000 at par, and at market prices about £147,000,000. A large part of these amounts represents worthless properties which have been "floated" during "boom" times; yet, notwithstanding this excessive capitalization, the mines yielded about 7 per cent on the total capitalization at par, and about 3.5 per cent on market prices. Eliminating properties notoriously without value, and also the capitalization of certain "deep-level" properties which have not, as yet, reached a producing stage, we may pronounce the returns from bona-fide investment and competent management to have been exceedingly satisfactory.

In 1898 77 companies operating stamp-batteries produced 4,295,609 crude ounces of gold bullion of the value of £15,141,376, and of these companies 41 distributed in dividends for that year £4,847,505, or about 15.6 per cent on their nominal capital of £31,018,000. The market capitalization of the same companies, however, was £82,555,000; and the dividends returned on this capitalization were about 5.9 per cent.

The majority of the "outcrop companies"—indeed, nearly all of those situated in the central section (extending from the Langlaagte Estate to Knights, on the Witwatersrand) — are free of indebtedness and will not require further capital, unless for future increase of plant, especially for enlarging their milling capacity. Any additional capital required for such purposes could be provided either from the profits already earned, or by the issue of debentures, to be ultimately likewise redeemed from profits.

For the "deep-level" properties, on the other hand, and especially for those covering the deeper levels, that is, those situated on the second and third lines of claims parallel to the outcrop, a large amount of money must be ex-

pended before the mines can become productive. Instead of increasing the capital stock for this purpose it is generally the practice of the Rand companies to raise the money by the issue of debentures. There has been no difficulty in obtaining working capital by this means, often to the extent of £400,000 or £500,000. About £5,000,000 of such debentures were issued up to 1903.

Houses of high standing have been able to raise such loans of working capital upon debentures bearing interest at 5 to 6 per cent per annum, giving as an inducement to the purchaser the right to exchange the debentures for fully paid-up shares, at a certain price, within a given period from the date of issue, during which period the shares are likely to command a good premium.

Nearly all the Rand companies in 1903 were controlled by large financial concerns, such as Wernher, Beit and Company, who control the Rand Mines group and some other properties; the Consolidated Gold Fields Company, which controls the Simmer and Jack (one of the largest mines on the Rand), the Robinson Deep, the Nigel Deep and some of the first, as well as many of the second, row of "deep-levels"; the Messrs. Farrar, who control the East Rand Proprietary and its subsidiaries, the Angelo, Dreifontein, New Comet, etc.; Barnato Brothers, who control the Primrose, Glencairn, Ginsberg, Roodepoort, etc., and A. Goerz and Company, who control the Geldenhuis Estate, the May Consolidated, the Lancaster and the Geduld Princess Estate, etc.; Mr. Neumann and associates, controlling the Consolidated Main Reef, Treasury and Wolhuter; Messrs. Alba, controlling the Aurora West, Meyer and Charlton, George Goch, Van Ryn, etc., and J. B. Robinson, who controls the Robinson group, comprising the Langlaagte and Randfontein Estates and their several subsidiaries. These parties had the entire financial and technical direction of the companies in which they possess a major voting interest. All the important companies are listed on the stock exchanges of Johannesburg and London.

GOLD PRODUCTION OF THE TRANSVAAL.

1884–89	£2,678,231
1890	1,869,645
1891	2,924,305
1892	4,541,071
1893	5,480,498
1894	7,667,152
1895	8,569,555
1896	8,603,821
1897	11,653,725
1898	16,240,630
1899	15,728,693
1900	1,510,131
1901	1,096,051
1902	7,253,665
1903	12,589,137
1904	16,055,000
1905	20,802,000
1906	24,580,000
1907	27,404,000
1908	29,958,000
1909	30,926,000
1910	32,002,000
1911	34,992,000
1912	38,758,000
1913	37,658,000
1914	35,588,000
1915	37,264,000
1916	38,110,000

The financial administration of the Witwatersrand mines is, as a rule, able and honest. The Transvaal law requires a monthly statement of the amount of ore crushed, gold produced, etc. Such reports are published monthly by the companies in great detail.

As a rule, the Johannesburg local directors and mine managers are exceptionally trustworthy and full reliance can be had on the accuracy of their reports. Sometimes, however, attempts are made, for market purposes, to underestimate the working costs, by charging to capital expenditure money which should strictly be reckoned as working expenses. In this way fictitious profits may be shown; but the practice is not usual, and latterly has been seldom adopted.

In the formation of a new company the owner or owners of the mining claims (and often the financial promoting syndicates) usually receive a certain number of vendors' shares of the company to be formed by an amalgamation of claims. Moreover, a certain number of shares are sold (usually at par) for working capital; and a certain number of shares are retained as a treasury reserve, which frequently are sold, some time afterward, at a considerable advance. The majority of the companies have greatly increased their capital since their formation; but, notwithstanding this fact, their new shares are in many cases several hundred per cent above par.

Economic Conditions.— The methods of mining in the Witwatersrand district present no features specially different from those followed in the exploitation of similar deposits elsewhere. (See GOLD MINING; GOLD STANDARD AND GOLD PRODUCTION). In 1898 there were employed upon the Rand 9,476 whites and 88,627 Kaffirs. The attempt to introduce Chinese labor early in the century was but partially successful. In December 1915 there were 23,069 whites and 223,764 native negro workers in the mines. The white laborers are predominantly British, though the leading consulting and superintending engineers and many of the important members of the technical staffs are Americans. The mine- and mill-foremen are usually either Americans or British subjects who have had mining experience in America. These men are generally thoroughly competent; but the average of white labor as a whole, especially among carpenters and machinists, is far below the American standard. Considerable improvement, however, is taking place in this regard. A large part of the manual laborers on the surface and all the miners except those running machine-drills are blacks — Basuto, Zulu, Shangani and Zambesi "boys." The quality of this black (native) labor is very poor. Most of the "boys" are utterly inexperienced when first employed; and they rarely remain long enough to acquire great proficiency. When they arrive, making in many cases tramps of several hundred miles to reach the mines, they are in an emaciated condition and require to be "fattened up" for several weeks. After a few months' sojourn they become fine specimens physically; and, in some cases, they remain long enough at the mines to become expert miners. But it is exceptional to find great efficiency among the "boys" in drilling holes. They receive average monthly wages (1902) of £2 9*s*. and their board (which amounts to about 12*s* per month). Their task is a hole of three feet per day. The holes to be drilled are located by the shift boss

and the holes are fired by him, firing by the "boys" being usually forbidden. Some of them, however, acquire sufficient knowledge to fire a hole and also to run a machine-drill. The latter work is generally done by contract, and the contracts are given to whites.

By reason of the rapidly increasing demand for labor and the obstacles interposed by the Boer government, there was a great deficiency of native labor. As a result large numbers of air-drills have been necessarily employed in stoping, to the great disadvantage of the mines, since much of the ground is of such a character as to make stoping by machine-drills economically unadvisable. Where the reefs are flat or small, the employment of drills necessitates the breaking down of much larger blocks of ground than would be necessary with hand-drills. Moreover, work under such conditions involves the excessive use of dynamite — an important item where dynamite is as expensive as it has been upon the Rand — and creates at the same time an undue amount of fine waste, which not only lowers the yield of the ore in the battery, but increases the production of slimes.

The percentage of working costs of mining is given in the subjoined table, from which may be seen that the white and the native labor represent about 30 per cent each.

TABLE SHOWING PERCENTAGE OF WORKING-COSTS.

	Per cent
White labor	31.22
Native labor (including food)	29.83
Explosives (dynamite, fuse, caps)	9.70
Coal	9.07
Chemicals (cyanides, etc.)	3.22
Tools, steel, shoes, dies, etc	3.29
Mining timbers, lumber	4.05
Candles, lighting	1.38
Sundries	8.24
Total	100.00

Before the Boer War the difficulty of securing adequate labor was so pronounced that Cecil Rhodes, some 10 years ago, appealed to the Transvaal government for permission to import coolies for work in the Rand mines, but was met with a curt refusal on the part of President Kruger. Since the incorporation of the two Boer republics into the British empire matters have become still worse in this respect. For, whereas in 1897 about 100,000 Kaffirs were working in the mines, it was found impossible in 1903 to secure more than 60,000, and no fewer than 200,000 were needed. All attempts to obtain native labor from other parts of British Africa failed, owing to the inherent indolence of the black man and to his particular aversion to underground work. The consequence was that the owners were unable to work their mines to anything approaching their full limit. This was all the more serious when it is borne in mind that throughout the war, and for some time afterward, the Transvaal mines, comprising the most important gold-producing area of the world, were practically at a standstill, causing a scarcity of gold.

Conditions in 1917.— So far, we have been discussing conditions in the Transvaal in 1903, when the production was £12,589,000, or $60,000,000. Within two and a half years thereafter the Transvaal passed Australia in gold production and caught up with the United States. In 1906 the territory became, what it has ever since remained, the world's greatest producer of gold, with an output that year of $123,000,000. It could and should have been even greater, for the gold was there, and the stamp-mills, but the laborers were few. White men do not many of them care to go to South Africa, and the natives are not inclined to hard work. Chinese were imported, but they did not like it, and after getting in a few thousand the experiment was abandoned. Then came the tube mill, as an improvement on the time-honored steam-pump, and this helped the production. In 1903 the 7,915 stamps were half of them idle most of the time. In 1916 there were 9,250 stamps and 310 tube mills, and the product over three times as great, the average monthly reduction being 2,370 tons of ore, averaging 6.26 hundredweight gold per ton, or £3,170,000. The cost of production is still phenomenally low, although 54 per cent of it is labor. In 1916 the average ton of ore cost $4.34 to mine and turn into gold, and yielded a profit of $1.96. Those who think a gold mine must be all profit may well reflect on this, that if the cost in these greatest of mines had been 45 per cent greater, there would have been no profit in getting out the gold. The largest producing Rand mines in 1916 were the following:

	Monthly output of ore
Crown mines	203,000 tons
Randfontein Central	185,712 tons
East Rand Proprietary	155,500 tons
Knights Deep	102,400 tons

It is, therefore, apparent that the largest producer of these mines is yielding (at $4 a ton) over $8,000,000 a year of gold. Wonderful as this is, yet these four great mines are scarcely as valuable as some of the new mines coming into wealth in the Far East Rand territory. This new section has been developed by following the trend of the ore beds as they go deeper, and sinking shafts anywhere from 4,000 to 7,500 feet deep. These new mines are coming into their best, while those quoted are at their zenith or declining. T. A. Rickard considers the New Modderfontein the greatest mine in the world. In 1916 it was yielding 53,500 tons a month of very rich ore, averaging a value of $7.65 a ton, or 70 per cent more than the average for the whole Rand. But the wonderful part is that borings have tested out a continuance of this rich ore to the total of nearly 20,000,000 tons, so that this mine may reasonably look forward to a production of $125,000,000 worth of gold in the next 20 years. When will this phenomenal supply of gold give out, as all gold mines and gold fields do eventually? In 1903 the accepted estimate of remaining gold to be mined was $3,500,000,000. Since then $2,000,000,000 has been taken out, and yet some enthusiasts think there is $3,000,000,000 left.

South Africa as a whole gives no promise of becoming a leading factor in the economic life of the world. Mr. Bryce's forecast of the gold regions outside of the Rand throws light on the whole situation. He says:

"Assuming that a fair proportion of the quartz-reef gold fields turn out well, it may be predicted that population will increase in and around them during the next 10 years, and that for some 20 years more this population will maintain itself, though of course not necessarily in the same spots, because as the reefs first developed become exhausted, the miners will shift

to new places. After these 30 or possibly 40 years, that is to say, before the middle of the 20th century, the country, having parted with its gold, will have to fall back on its pasture and its arable land; but, having become settled and developed, it may count on retaining a reasonable measure of prosperity."

(The above was written by John Hays Hammond in 1903 and has since been revised by bringing the figures, etc., up to date.—ED.).

TRANSVAAL WAR. See SOUTH AFRICAN WAR.

TRANSYLVANIA, trăn-sĭl-vā'nĭ-ą (German *Siebenbürgen;* Hungarian, *Erdély*), Austria-Hungary; the southeast portion or region of the empire, since 1868 incorporated with Hungary; area, 21,500 square miles. The surface is mountainous, being covered with the Carpathian chain and its ramifications. The whole belongs to the basin of the Danube, which receives a great part of its waters circuitously by the Maros and the Szamos, both tributaries of the Theiss. The climate is healthful; the summer heat of the lower grounds is at times extreme. There are magnificent and valuable forests; fruits abound everywhere, and the culture of the vine is general. The crops include, besides the ordinary cereals, potatoes, etc., also maize, hemp, flax and tobacco. Fine breeds of horses, cattle and sheep are reared. Many horses are exported. Large numbers of swine are fattened. The wild animals include bears, wolves and wild boars. The minerals are important and include gold, silver, copper, lead, iron, quicksilver, antimony, coal and salt. The last occupies immense tracts. Manufactures have made little progress and are chiefly in the hands of Germans. The trade is chiefly confined to the natural produce of the country, and imported manufacturers. The chief towns are Kolozsvar (61,000), Brasso (41,000), Nagyszeben (34,000). Education is in a backward state. The population, about 2,500,000, is very mixed. Transylvania not being now a political division of Hungary, the reader is referred to Hungary for further statistics. The principal nationalities are Rumanians, Magyars and Germans, besides Gypsies, Jews, Bulgarians and others. The chief religious bodies are Roman Catholics, Greek Catholics and Protestants. The name Transylvania, signifying "beyond the woods," is due to the extensive forests on the western side. In ancient times Transylvania was a part of the province of Dacia. From the 4th century onward it was occupied by various nations in succession. In 1004 it was conquered by Stephen I of Hungary and was afterward governed by a viceroy (*voyvode*). In the 16th century the voyvode John Zapolya obtained Transylvania as a sovereign principality, but it could not maintain its independence against the house of Austria, and in 1713 was united to Hungary. In 1765 Maria Theresa raised it to the rank of a grand-principality. It suffered severely during the commotions of 1848–49, when there were massacres of the Magyars, and again in 1914–15 when it was invaded by the Russians.

TRANSYLVANIA COLLEGE, a nonsectarian institution of higher education at Lexington, Ky., founded in 1798. Its faculty numbers 29; the average annual attendance of students is 280; the tuition fees are $65; the living expenses, board, etc., $170. The productive funds amount to $414,936; the total income, including tuition or incidental expenses, to $43,253. The college colors are crimson. The library contains over 23,000 volumes. The number of graduates since organization is 3,555.

TRAP, any dark-colored volcanic rock of columnar structure, named with reference to their common stairlike arrangement. Most trap rocks are either finegrained basalts, diabases, diorites or gabbros. The term is a convenient one when the exact nature of the rock has not yet been determined and is largely used in field work. The Palisades of the Hudson, North Mountain in Nova Scotia, the Giants' Causeway and Fingal's Cave are familiar examples. The name is derived from the Swedish "trapp," applied to these rocks from their occurrence in step-like sheets.

TRAP-DOOR SPIDERS, large hairy theraphosid spiders of the family *Ctenizidæ* and its allies, which inhabit dry warm countries and form well-like pits or burrows in the ground, closed by a hinged lid. These burrows are placed in high, well-drained situations and are dug by the owners, who cut down and carry away the earth in their jaws, depositing it at some distance. The holes vary in size with the species and age of the occupant, and the largest may be more than a foot deep. The burrow of a species (*Ctenisa californica*) common in southern California is of that depth, and an inch in calibre, when the owner is fully grown. In some species the wells have a branch burrow slanting from one side, and others make two entrances, so that a plan of the burrow would resemble a Y. These burrows are lined with a coating of silk, and in every case the entrance (or entrances) is closed by a tight-fitting circular door composed of clay, bound and lined with silk, and hinged at one side to the lining of the burrow; the top of the door is left rough and earthy, so that when it is closed nothing betrays the presence of such a contrivance. In this snug castle the spider dwells in safety and comfort, rearing its young under the protection of the door, which it can hold so firmly shut that nothing short of tearing the structure apart will suffice to open it. In the species of the south of Europe the lining and door are much thinner than those made by the American trap-door spiders; and if these doors are torn off a new one will be made overnight, for several nights in succession or until the insect's strength is so exhausted that it can no longer produce the requisite silk. For further facts consult general works, especially Moggridge, 'Harvesting Ants and Trap-door Spiders' (London 1873). See SPIDERS.

TRAP-NETS. See POUND-NET FISHING.

TRAP-ROCK. See ROCKS; TRAP.

TRAP-SHOOTING, an outdoor sport increasingly and deservedly popular in the United States and Canada, in which by means of a mechanism now called the "trap" a disc of coarse pottery, "the clay pigeon," is thrown upward at an angle unknown to the sportsman, who thereupon sights his piece and fires while the disc is still in the air. The name trap-shooting is derived from the former practice of placing a series of traps in the ground, in each of which was imprisoned a live pigeon, and at a given signal of the marksman the operator

of the trap liberated one of the birds. The first mention of trap-shooting as a sport is found in an old English publication called the *Shooting Magazine,* issued in 1793, and it is there referred to as being a "well established recreation" of the period. Trap-shooting, both at live birds and inanimate targets, has become one of the most popular of British sports, but is not indulged in to nearly the same extent as in the United States. In the records of the Sportsmen's Club of Cincinnati, Ohio, for the year 1831 is found the earliest mention of trap-shooting in the United States. Cincinnati, therefore, appears to be the birthplace and early home of the sport in the United States. Passenger pigeons, and sometimes quail, were used in the sport. The Long Island Club was formed about 1840, and soon after the New York Sportsmen's Club was organized in that city. What may be termed the "glass ball" period in trap-shooting was inaugurated in 1866, when Charles Portlock of Boston, Mass., introduced the glass ball as the first substitute for live pigeons, and the new sport gained a considerable degree of popularity at once. In a few years improved traps for throwing the glass ball were developed and interest in the sport increased throughout the country. The first national trap-shooting tournament was held at New Orleans, La., 11–16 Feb. 1885, under the auspices of the National Gun Association. In the last quarter of the 19th century the sport became very popular; traps were improved, freaks in the shape of glass balls, which upon being hit belched forth smoke or feathers, were eliminated, and the now almost universal clay disc was introduced. The early rules for glass ball shooting were few: All matches or sweepstakes were shot over three traps placed 10 yards apart on a straight line. This was the same as the later rule made for target traps set Sergeant-system, except that the distance between the traps was less in the latter case. The traps were numbered 1, 2, 3, from left to right; No. 1 threw a left angle; No. 2 a straight-away, and No. 3 a right angle. The trap-puller was stationed six feet behind the shooter. The trap to be pulled was decided by the referee. He had three gun wads bearing the numbers corresponding to the traps and drew one from his pocket when the shooter took his place at the score, showing it to the puller who pulled the trap of that number. After the shooter took his place at the score he was not allowed to raise the butt of his gun above his elbow, under penalty of having the ball scored lost, whether it was broken or not. There was no restriction as to the size of shot used, or charge of powder, but not more than one and one-fourth ounce of shot was allowed. The rise was 18 yards, and all ties shot off at five single balls, 21 yards rise. In double shooting the distance was 16 yards, over two traps placed 10 yards apart; ties shot off at three pairs each, 18 yards rise. The same rules applied where the shooting was done over one trap, but the angle was changed at every shot, a screen preventing the shooter from viewing the angle of the trap. A late novelty in trap-shooting and one which greatly tests the skill of the marksman is the erection of the shooting towers. They are usually about 50 feet high and the "clay pigeons" are thrown from the top of the tower instead of from the ground. The levers are worked from below and hurl the targets at any desired angle.

The first and the only international trap-shooting contest was held at the Middlesex Club grounds near London, 11–13 June 1901. The conditions of the matches called for any 10 men from the United States against any 10 men from England, Ireland and Scotland, each man to shoot at 100 targets; the Americans to use but one barrel and one and one-fourth ounces of shot, while the British team were allowed the use of both barrels and one and one-eighth ounces of shot, the targets to be shot at 18 yards rise. A purse of $5,000 was to go to the winner of three out of five contests. The Americans won three consecutive matches, ending the contest on the third day, the total score standing:

	Americans	British
First Match	866	801
Second Match	877	794
Third Match	843	749

W. R. Crosby of the American team scored 93, 95 and 90 in the three matches as against 87, 87 and 83 by Izzard, Joynt and Pike, respectively, of the British team. On 19 June of the same year the American team defeated a picked Scottish team, the total score being American 969; Scottish 882. For a full and complete history of this sport, with illustrations of very many traps and discussions of their individual merits, together with rules for matches, scoring, etc., consult Eaton, D. H., 'Trapshooting' (Cincinnati, Ohio, 1918).

TRAPA. See SINGHARA NUT.

TRAPANI, trä'pä-nē, Italy, a seaport and episcopal see in Sicily, 47 miles west of Palermo, capital of a province of the same name in the extreme west end of the island. It is a walled town, and its port the safest on the western coast. The chief edifices are the cathedral, provincial palace and lyceum. A statue of Victor Emmanuel stands in the piazza bearing his name. The manufactures consist of coral, alabaster and shell objects, ice and olive-oil. There is an active trade in wine, salt and flour. The fisheries are important, especially sponges and tunny-fish. At a short distance northeast of the town is Mount San Giuliano, the ancient Eryx (q.v.). Pop. of the town about 15,000; of the commune 60,799; of the province, 367,507.

TRAPEZIUM, and TRAPEZOID, two geometrical terms. As commonly accepted in the United States the word trapezium is used to denote a quadrilateral of which no two sides are parallel, while trapezoid is the name applied to a quadrilateral two of whose sides are parallel. Ancient Greek writers did not always make a clear distinction in their usage of the two terms, and in England the definitions are the reverse of those here given.

TRAPHAGEN, Frank Weiss, American chemist and metellurgist: b. Eaton, Ohio, 20 July 1861. He was graduated from the School of Mines of Columbia University in 1882, and afterward pursued special studies in analytical and applied chemistry receiving the degree of doctor of philosophy. In 1884 he became an instructor in chemistry and physics at the military academy at Staunton, Va. He was professor of chemistry at the College of Montana,

1837–93, and in the latter year accepted the chair of chemistry at Montana State College, which position together with that of chemist of the Montana Experiment Station he occupied until 1903, when he was elected to the position of professor of metallurgy at the Colorado School of Mines, Golden, Col. In 1917 he became professor of metallurgy at the South Dakota School of Mines. He has published in addition to numerous State bulletins 'A New Departure in Cyanide Treatment'; 'Salicylic Acid in Fruits'; 'Notes on Alkali Soil in Montana'; 'Sugar Beets'; 'Food Adulteration'; 'Colorado School of Mines Notes,' on assaying and many articles on metallurgical subjects. Professor Traphagen is Fellow of the London Chemical Society, the Society of Chemical Industry, the German Chemical Society, the American Association for the Advancement of Science, the American Chemical Society, member of American Institute of Mining Engineers, and many other scientific bodies.

TRAPPISTS. See CISTERCIANS; ORDERS, RELIGIOUS; RANCÉ, DOMINIQUE ARMAND JEAN LE BOUTHILLIER DE.

TRASIMENO, Lago, lä'gō trä-sē-mā'nō. See PERUGIA.

TRASK, Spencer, American banker: b. Brooklyn, 1844; d. 31 Dec. 1909. He was educated in Princeton University from which he was graduated in 1866 to enter a Wall street banking house and in 1881 established one under his own name with branches in the larger cities. He was a supporter of many inventions including those of Edison; was identified with many corporations and was widely known as a man of philanthropic tendencies. He built Saint Christina's Home for Children at Saratoga and did much to restore the popularity of the springs there. He was killed in a railroad accident.

TRASKITES, the early designation of the Sabbatarian Puritans, an English sect. The title was derived from John Trask, of Somersetshire, who about 1617 became a preacher in London. Trask enjoined upon his followers a fast of three successive days, saying that with the third day's fast they would attain the state of justified saints; enforced the performance of all things according to the law of Scripture; required that Sunday be observed with a strictness equal to that with which the Jews observed the Sabbath; eventually made Saturday the day to be observed thus, this feature becoming distinctive of the sect; and established several ceremonial customs. In 1634 the commission for ecclesiastical causes included «Traskists» among the «separatists, novelists and sectaries» to be proceeded against by the authorities. Trask was haled before the Star chamber, and put in the pillory. Later, he is said to have recanted, though it is also recorded that before his death he became an Antinomian. The Traskites perhaps also assumed the title Separatists (q.v.). The modern Seventh-Day Baptists represent the Sabbatarian views of the Traskites.

TRASS, a trachytic tuff from the Eifel district, which is used on the Rhine for hydraulic cement.

TRAUTWINE, trowt'wīn, **John Cresson,** American civil engineer: b. Philadelphia, 20 March 1810; d. there, 14 Sept. 1883. He entered the office of William Strickland, a leading engineer and architect of Philadelphia, in 1828, and made rapid progress in the profession. He designed and had charge of the construction of the Penn Township Bank, assisted in the construction of the United States Mint and other public buildings, and in 1831 became civil engineer on the Columbia Railroad. He was engaged in railroad engineering until 1842, and in 1844–49 was associate engineer with G. M. Totten in the construction of the Canal del Dique, connecting Magdalena River with the Bay of Cartagena. In 1850 he was again engaged with Totten in making the surveys for the Panama Railroad. He was later occupied in a survey of the harbor of Arecibo, Porto Rico, and in railroad surveying in Pennsylvania. He went to Honduras in 1857 to survey the route for an interoceanic railroad, and in 1858 he examined the harbor of Montreal and planned for that city a system of docks. He retired from active business after 1864, though he continued to act as consulting engineer and expert. He published 'Method of Calculating the Cubic Contents of Excavations and Embankments' (1851); 'Field Practice of Laying Out Circular Curves for Railroads' (1851), and 'Civil Engineer's Pocket-Book.' This latter has become standard, is reissued at short intervals, and is popularly called 'Trautwine.'

TRAVANCORE, trăv-ạn-kōr', India, a native state in the province of Madras, occupying the extreme southwestern part of the Indian peninsula; area, 7,594 square miles. The soil is well watered, fertile and well cultivated. Coco and areca-nuts, pepper, tea and coffee are exported. The state is well administered, and both elementary and higher education provided for. It yields an annual revenue of about £761,000. The inhabitants are mostly Hindu, and ruled by a raja. Pop. about 3,428,975, being 452 to the square mile, which is excessively dense, even for India.

TRAVELER'S TREE, an arborescent plant (*Ravenala madagascariensis*) belonging to the family *Musaceæ*. It has a succulent or woody stem, and broad, shining, banana-like leaves, among the largest in the world. They are in two opposed rows and in one plane, and form a semi-circle above the base like an open fan, with ribs many feet long. The *Ravenala* is a very conspicuous object in Madagascar, its original habitat, and usually grows in clumps. Water from the surface of the leaves is conveyed down the channeled petiole to reservoirs in the excavated basal sheaths, whence the thirsty traveler can obtain a refreshing liquid even in the driest seasons. It is otherwise a very useful plant since the leaves are serviceable in house-building, as thatch, partition, and even in making walls. The hard, external cotex is stripped off, beaten flat and used for flooring. The green leaves do duty also as wrapping-paper, rain-sheds, table-cloths and dishes, and when folded properly, as spoons or drinking vessels. The large flowers are in a spathe, and are racemose, maturing into woody capsules, enclosing seeds that are edible and have a pulpy and lacerate blue aril yielding an essential oil.

TRAVELER, The. Oliver Goldsmith's 'The Traveler, or a Prospect of Society,' a

didactic poem in couplets, was published in 1764, with a dedication to the poet's brother, the Rev. Henry Goldsmith. The first of Goldsmith's works to attract wide attention, it went through many editions and was pronounced by Johnson the best English poem since the death of Pope. The theme is somewhat akin to that of Johnson's 'Rasselas.' From a point of vantage in the Alps the poet takes survey of the nations of Europe, asking which has the greatest share of happiness. He concludes that each government and way of life has its drawbacks as well as its advantages, and that the "bliss which centres in the mind" may be attained as well under one system as another.

> "Still to ourselves in every place consign'd
> Our own felicity we make or find."

The successive pictures of Italy, Switzerland and England are interesting and nicely differentiated. The versification is smooth and graceful and the expression felicitous. Especially pleasing is the intimate account of France, "gay sprightly land of mirth and social ease," where the poet himself in earlier days had piped to the "sportive choir." Goldsmith's mild political convictions appear in his rather unconvincing analysis of the ills of British freedom; his social sympathy, in the deprecation of luxury and selfishness on the part of the English landlords. Consult 'Poetical Works' (edited by A. Dobson, 1906); Macaulay, essay on Goldsmith, ('Miscellaneous Writings').

JAMES H. HANFORD.

TRAVELING LIBRARIES. A traveling library has been defined as "A collection of books lent for stated periods by a central library to a branch library, club, or other organization or, in some instances, to an individual." The chief characteristics from which it derives its name are its temporary location in the place to which it is sent and the implication that any traveling library will or may be changed for others.

The date of the first traveling library is uncertain. Passing by the itinerant chapman and ballad-seller, the religious colporteur and the camp library of Napoleon I listed in Bourrienne's 'Mémoires,' the "Circulating schools" of Wales, promoted in 1730 by Griffith Jones, and the later similar schools of the General Assembly of the Kirk of Scotland in the Highlands and the Scottish islands may be noted as forerunners of educational extension and its logical corollary, traveling libraries. The first really practicable traveling library plan seems to have been started by Samuel Brown in East Lothian, Scotland, in 1817, though it is stated that the principle had been used with some Scottish parish libraries as early as 1810. Brown procured 200 selected volumes "about two-thirds of which were of a moral and religious tendency, while the remainder comprised books of travel, agriculture, the mechanical arts and popular sciences." Four libraries of 50 volumes each were stationed in Aberlady, Salton, Tyninghame and Gawald. In 20 years these libraries had increased to 3,850 volumes, distributed through 47 villages. Jean Frédéric Oberlin is said to have founded itinerant libraries in his parish of Waldbach in the Vosges Mountains at about the same time that the East Lothian libraries were established. Both of these early plans barely survived their founders.

A successful system of traveling libraries was begun by the public library of Melbourne in 1860. Oxford University in 1878 and Cambridge University soon after began to send out traveling libraries as an aid to their university extension courses.

Traveling Libraries in America.— The American lyceum movement demonstrated the need of libraries to conserve the results of its work. "Itinerating libraries" and a county system of traveling libraries were proposed as early as 1831. In 1848, the American Seaman's Friend Society began to furnish libraries to American ships, afterward extending its work to naval hospitals and life-saving stations. The United States government has supplied similar libraries to lighthouses. These were exchanged frequently. The first general American traveling libraries supported by public funds were authorized by the New York State legislature in 1892. The first library was sent out by the New York State Library in February 1893. Beginning with 10 libraries of 100 volumes each the circulation for the first fiscal year was 2,400 volumes. This increased in 1918–19 to a total circulation of 43,958 volumes sent out in 1,099 different collections, with a total stock of 100,641 volumes. Michigan and Montana enacted traveling-library legislation in 1895 and Wisconsin and Iowa in 1896.

Virtually every State library commission now maintains a traveling library system for the libraries of its own State. The work of the traveling libraries section of the Educational Extension Division of the University of the State of New York may be taken as typical of the more highly organized form of this work in the State commissions. This division will send traveling libraries "to any place in New York State, preference being given to places where it is difficult to provide good books for free circulation." The State pays all transportation charges (other than local cartage). Seven different types of traveling libraries are provided: (1) Libraries for general readers; (2) libraries for public schools, to supplement the school libraries but not to provide supplementary readers or textbooks; (3) libraries for small public libraries, to supplement local library collections where library funds are scanty; (4) libraries for children; (5) libraries for foreigners, in several foreign languages; (6) libraries for study clubs, granges, private schools, Sunday schools, churches, etc.; (7) house libraries for the individual or the single family, preferably in rural homes.

When the books in these libraries are available to all members of a community no fee is charged for the first 25 volumes. In the case of restricted use (as in classes 6 and 7) a small fee is charged. Small fees are also charged for volumes in excess of 25. The period of loan is from three months (in the case of house libraries) to one year (in case of schools and study clubs). The collections are of two types: fixed and open shelf. The former are lent as a unit and the borrower is allowed no substitutions for titles on the list. The latter are selected from the general collection of the extension department to meet, as far as possible, the specific desires of the organization or person borrowing the library. The fixed collection is more economical as it ensures the use

of the whole collection; the open shelf collection is more flexible and, therefore, more satisfactory to most people. The tendency is toward the open shelf collection.

The large city libraries maintain similar systems. Their "deposit stations" are essentially traveling library collections. In addition, smaller collections of books are sent to clubs, schools, organized societies, police and fire stations and many other types of organizations. The New York Free Circulating Library, which had for several years supplied traveling libraries to schools, in 1897 established a traveling library department. This, which is now the Extension Division of the New York Public Library, in 1918 sent out 46,402 volumes to 417 agencies. The Free Library of Philadelphia began its traveling library work in 1896. A typical example of the use of traveling library books is seen in the Saint Louis Public Library which reports a circulation of 240,883 volumes in the fiscal year 1918–19.

An interesting variant of the traveling library is the book-wagon or automobile which delivers books along definite routes radiating from some library centre. The pioneer book-wagon in the United States was started in April 1905 by Miss Mary L. Titcomb of the Washington County Free Library of Hagerstown, Md. The Connecticut Public Library Committee and the Delaware State Library Commission have also maintained book-wagons. Book-wagons have also been used in parts of Wisconsin. A local book delivery automobile has recently been put into service by the Endicott (N. Y.) Free Library. To some extent rural mail delivery wagons have been used for traveling library purposes but the possibilities in this direction are capable of much greater development.

Several unsuccessful attempts have been made to establish traveling libraries on a commercial basis. The best known of these, the Booklover's Library and the Tabard Inn Library, founded in Philadelphia in 1900 and 1902 respectively, were measurably successful for some time.

Educational Significance of the Traveling Library.— The traveling library idea has spread throughout the civilized world and the small collection of books changed frequently is known in many places in which the more elaborate public library is as yet unknown. The late war was instrumental in giving the idea greater prominence than ever before. The case of books supplied by the Red Cross, the American Library Association or other relief organizations followed the troops into the trenches as well as into the camp and hospital and prison camps. It was a familiar sight on every war vessel or transport. The Germans as well as the Allies were quick to see the value of the traveling library in maintaining morale.

The great advantages of the traveling library are economy, mobility and adaptability. The collection is limited to books definitely chosen for some purpose. The obsolete and useless are eliminated. The frequent change of collections gives each group or community receiving the libraries access to the volumes in all the groups. Books on timely topics or those needed to meet changes in community taste can in this way be provided at a minimum cost. The traveling library can be put into the home, the store, the grange or wherever people congregate. It is not limited to any one place. No permanent building or special assistant is needed to make it give fairly satisfactory service if intelligence in selection is shown by the library which issues it. The only records needed are the simplest types of lending records.

The traveling library is of special significance in four different directions: in providing the rural population and special organizations with library facilities, in aiding the rural schools to keep their instruction abreast of the times, in promoting educational extension movements of all kinds and in promoting the establishment and development of permanent libraries. The town and village libraries, aided by the county library systems, are beginning to provide much more adequate library service for the rural population than formerly. (See RURAL LIBRARIES). Nevertheless, there will always be a considerable portion of the population for which the traveling library will furnish the only really convenient access to good books. Even the proposed extension of the parcel post service for library books at reduced rates will supplement, not supersede, the larger collection of the traveling library. The factory and the machine shop, the social club and the fraternal organization also find it much to their advantage to have immediately at hand a small, well-chosen collection of books changed often enough to prevent their becoming stale.

The rapid and extensive changes in school curricula and the modern methods of teaching, most of which imply considerable use of material outside the textbook, are making the school library more than ever an essential part of the well-equipped school. The rural and small town schools, no less than the schools in the large cities, need fresh books in their libraries. In most cases the funds available for this purpose are inadequate. The traveling library sent by the State Library Commission, the State Department of Education or other central agency, can fill this need better and at less expense than the local school board. It can supply the books needed to supplement the standard books, the reference books and the supplementary readers and textbooks which the school must have as a permanent part of its equipment. In many cases, the traveling library will show whether or not the desired book is really needed permanently. The value of the traveling library is so well recognized by teachers that practically no central distributing agency can supply the demand made by the schools for this service. In many cities (e.g., Rochester, N. Y., Buffalo, N. Y., Cleveland, Ohio, Portland, Ore., etc.), the public library has a regularly organized system of classroom libraries, changed at regular intervals and intended to supplement the school work. See also SCHOOL LIBRARIES.

Practically every well-devised scheme of educational extension, whether lyceum movement, university extension centre, study club, correspondence course, Chautauqua movement or Sunday school, has recognized the need of a small library to conserve and amplify the results of the instruction. The courses on a commercial basis have rather generally tried to sell personal collections to their patrons. Those without commercial intent have usually seen the need of larger, more flexible collections, available to all taking the extension work and sub-

ject to changes frequent enough to maintain variety. The traveling library has demonstrated its value in these cases. It has made it possible for the educational work to be varied in subject. It has enabled the ambitious student to go far beyond the limits of the lecture or the prescribed textbook. It has made true Carlyle's oft-quoted statement, "The true university of these days is a collection of books."

The development of traveling library systems has in most cases been followed by the establishment of permanent public libraries or the further development of those already established. The advantages of the traveling library are so manifest under such a variety of conditions that State legislatures have rather generally been willing to make some appropriations for their establishment and support. The traveling library implies a central administrative agency. This has required the formation of a State Library Commission or a similar body charged with the supervision of traveling library work. The traveling library, when intelligently used, has generally shown the need of larger, more stable collections of books than the library commission could supply. The logical result has been an agitation, by the study club, the school or the other organization using the traveling library, for a permanent public library. Many of the smaller libraries in all parts of the country have originated in this way. The "County system" has been the result as well as the cause of traveling libraries. The contribution of the American Library Association's war service libraries deserves special mention. Up to 1 Sept. 1919 the association had given 70 collections comprising 22,325 volumes to reconstruction units, colleges, universities and other permanent organizations in nearly 20 of the present countries of Europe and Asia. These collections are composed of books formerly used in the traveling libraries furnished the army, the navy and the marine corps through the American Library Association and other relief agencies.

Complete statistics of traveling libraries are rather difficult to obtain. As previously intimated, virtually every State Library Commission, every large public library, many extension departments of universities and an increasing number of commercial corporations maintain them. Different methods of calculating circulation and different interpretations of the term "traveling libraries" further complicate the matter. The more important original sources are indicated in the appended bibliography.

Bibliography.— Many references are included in Cannons, H. G. T., 'Bibliography of Library Economy' (London 1910), and in 'Library Work, Cumulated' (Minneapolis 1912). Current statistics of State systems are included in the 'League of Library Commissions Handbook' and in the bulletins of the various commissions. Statistics of city systems are to be found in the reports of the individual libraries. For the early history of the movement consult Brown, Samuel, 'Some Account of Itinerating Libraries and their Founder' (Edinburgh 1856); Brown, Wm., 'Memoir Relative to Itinerating Libraries' (Edinburgh 1836; reprinted New York 1836); University of the State of New York, 'Study clubs: annual report 1897' (Albany 1898; Extension Bulletin 23); 'Libraries and University Extension' (Albany 1892; Extension Bulletin 4); Dewey, Melvil, and Avery, Myrtilla, 'Traveling Libraries' (Albany 1901; Home Education Bulletin 40); and Adams, H. B., 'Public Libraries and Popular Education' (Albany 1900; Home Education Bulletin 31). On organization and management consult Hutchins, F. A., 'Traveling Libraries' (Boston 1902; American Library Association, Library Tract 3); Bullock, Edna D., 'Management of Traveling Libraries' (Boston 1907; American Library Association Library Handbook 3); Eastman, Linda A., 'Branch Libraries and other Distributing Agencies' (Chicago 1911; American Library Association Manual, chap. xv). Koch, T. W., 'Books in the War' (Boston 1919) describes the traveling library service of the different countries in the World War.

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TRAVELING SIDEWALK, a transportation system consisting of movable, parallel, continuous platforms to carry passengers from one point to another. They were first practically tested at the World's Columbian Exposition in Chicago in 1893 and since then successfully installed in Berlin. The sidewalk built for the Paris Exposition in 1900 was over three miles long and consisted of three parallel platforms, the outer one being stationary, the next having a speed of four kilometers and the inner one a speed of eight kilometers per hour. With these speeds it was found to be very easy to step from one to the other at any point. The system is excellent and practicable, and it is generally believed that only the opposition of existing traction interests prevents its adoption in a number of large cities. It has been proposed to build them for 3, 6, 9 and 12-mile speeds and to place seats on the speediest platform and run it under cover. It is estimated that they will carry more people at less cost in a congested territory than any other system.

TRAVELING STAIRWAY. See ESCALATOR.

TRAVERS, Jerome Dunstan, American golf champion: b. Montclair, N. J., 1887. He held the championship of New York for five years and of New Jersey for three years and won the national amateur title for six years in succession (1907–13), finally losing it to Ouimet in 1914. In 1915 he won the national open title. Author of 'Travers' Golf Book' (1913) and 'The Winning Shot' (1915).

TRAVERS, Morris William, English scientist: b. London, 1872. He was educated at University College, London, and in France. Returning to his home school he taught there until 1903; was professor in chemistry at Bristol and finally became director of the Indian Institute of Science at Bangalore (1906–14). He specialized in the study of gases at a low temperature and was the author of several books on the subject, notably 'The Attainment of Very Low Temperatures' (1904).

TRAVERSE CITY, Mich., city, county-seat of Grand Traverse County, on Grand Traverse Bay, an arm of Lake Michigan, on the Pere Marquette, the Grand Rapids and In-

diana, and the Manistee and Northeastern railroads, about 145 miles north of Grand Rapids and about 60 miles northeast of Manistee. Traverse City is in an agricultural and fruit-growing region. The excellent harbor gives the city shipping advantages to all the lake ports. The city is extensively engaged in manufacturing and is especially known for its production of oval wood dishes and corn starch. Other manufactures are flooring, fruit baskets, sash and doors, interior finishings, wagons and sleighs, farm implements, flour, leather, lumber and foundry and machine-shop products. The city has three banks with a combined capital of $310,000. The Northern Michigan Insane Asylum is located here. The city has a high school and five ward schools, municipal buildings, a public library and churches of all denominations. Traverse City was settled in 1852 and became a city in 1896. It is governed by a mayor and a council of 10 elected every two years. Pop. 14,000.

TRAVERTINE, calcareous sinter or chemically precipitated calcic carbonate, generally from streams or lakes, the waters of which contain an excessive amount of lime in solution. It either encrusts vegetable or inorganic matter, or forms a loose more or less porous or spongy mass on the surface of ledges. It is much used in Italy for building stone, Saint Peter's at Rome being constructed of it; the outer walls of the Colosseum also exhibit travertine. See SINTER.

TRAVIS, William Barrett, American soldier: b. Conecuh County, Ala., 1811; d. near San Antonio, Tex., 6 March, 1836. He was admitted to the bar in 1830, practised law at Claiborne, Ala., and in 1832 removed to Texas, where he soon after took up arms in the struggle for Texan independence. The old mission station of San Antonio de Valerio had been converted into a fort named the Alamo (q.v.) and Travis was in command of it with a garrison of 140 men, when, on 23 Feb. 1836, Santa Anna attacked him with a force of 4,000 Mexicans. The garrison defended the fort without the loss of a man for 10 days, though the only reinforcement which reached them was one of 32 men. A breach was finally made in the wall and in the desperate hand-to-hand struggle which ensued the entire force of Texans, with the exception of Travis and four of his men, were killed. The survivors were taken prisoners and were put to death by order of Santa Anna. The incident forms one of the most thrilling stories in American history, and the object of Travis, to engage the Mexicans for a sufficient period to enable General Houston to organize his army, was accomplished when six weeks later the Texans met and overwhelmed Santa Anna at San Jacinto, rallying with the war-cry "Remember the Alamo!" Consult Amelia Barr, 'Remember the Alamo.'

TRAWLING, a European mode of fishing, very common in some European waters, in which a net in the form of a large bag 70 to 100 feet long, narrowing to the closed end, is dragged along the bottom of the sea. The mouth or wide end of the net (in the "beam trawl") is kept open by a beam, at the ends of which are attached the ends of the rope by which the net is dragged along. In the "otter trawl," which has largely superseded the beam trawl, there is no beam and the mouth is kept open chiefly by two boards that rest edgewise on the bottom and are spread out diagonally by wire ropes attached to them and connected with the trawling vessel. In the narrow, closed end of the net the fish are collected and lest they should escape there is usually an inside net opening backward. This mode of fishing is practised to a very great extent in the seas round the British Islands, especially in the North Sea, for nearly all kinds of fish except herring and mackerel. Cod, whiting and other white-fish are taken in this way in large numbers and some kinds of flat-fish, as soles, can scarcely be taken in any other manner. There are many small steam-vessels engaged in this industry, which largely developed in recent years, but was largely crippled by the Great War. The method is often objected to as destroying fish spawn and ultimately tending to injure the productiveness of the fishing-grounds, but except, perhaps, as regards certain localities, this does not seem to be conclusively proved. However, it has been prohibited within three miles of the British shores and is not practised in the American fisheries.

TREACLE. See SUGAR GROWING AND SUGAR MAKING.

TREADMILL, originally a mill operated by man power, later adopted as a means of punishment, consisting of a large wheel, about 20 or 25 feet wide, with steps on its external surface, upon which the workers or criminals stand in the position of walking up-stairs. Their weight sets the wheel in motion and they maintain themselves in an upright posture by means of a horizontal bar fixed above them, on which they rest their hands, but they have to keep on climbing, climbing, until the weary task is ended. The power thus obtained may be applied to operate any convenient machinery. The treadmill is the invention of Sir William Cubit and was introduced into the prisons of Great Britain about 1820. It has been generally abolished.

TREADWELL, Aaron Lewis, American zoologist: b. Reading, Conn., 1866. He was educated at Wesleyan University and at the University of Chicago, at the last of which he took the Ph.D. degree in 1898. He became professor of zoology at the Miami University (1891–1900); was professor of biology at Vassar College (1900–14) and afterward was professor of zoology at the latter institution. He was instructor in marine biology at the government laboratory at Woods Hole, Mass. (1898–1906). He has written a number of articles on embryology and kindred topics.

TREADWELL, trĕd'wĕl, **Daniel,** American inventor: b. Ipswich, Mass., 1791; d. Cambridge, Mass., 27 Feb. 1872. His inventions include a machine for making wood screws, a power printing-press, a system of turnouts for single-track railroads and a machine for spinning hemp for cordage. As a consequence of this invention large works were erected in Boston in 1831 and several years later he furnished his machines to the Charlestown Navy Yard. He filled a contract with the government for 12 six-pounder cannon made of wrought iron and steel by an improved method

of his devising. This invention was secured by patent in the United States and England, and anticipated by at least 18 years the Armstrong gun formed upon the same plan with additional features. In 1822 he established and conducted, in connection with John Ware, the Boston *Journal of Philosophy and the Arts,* and during 1834–45 he was Rumford professor at Harvard. He published 'The Relations of Science to the Useful Arts' (1855); 'On the Construction of Hasped Cannon' (1864).

TREADWELL, Frederick Pearson, Swiss chemist: b. New Hampshire, 1857, but went abroad while still young and took the degree of Ph.D. at Heidelberg in 1878. In 1883 he went to Switzerland to become assistant in the technical school at Zürich where he became a professor in 1894. He is best known as the author of 'Handbook of Analytical Chemistry' (2 vols.), which has been translated into several languages and is used as a textbook in the United States.

TREASON. Treason is the highest crime known to society, and traitors by the law of every country are liable to the severest punishment. It is a crime directed against the very existence of the state itself and is, therefore, regarded as peculiarly odious. The ancient common law of England made a distinction between *petit* treason and *high* treason; thus it was petit treason for a wife to kill her husband or a servant his master; it was high treason for a subject to kill or attempt to kill the king or queen or to levy war against the king or adhere to his enemies. But this distinction was never introduced into American law. Here, what was known as petit treason was regarded as nothing more than murder. In England in early times judges sometimes declared offenses to be treasonable which were not so in fact. This was known as constructive treason. To remove this abuse Parliament enacted during the reign of Edward III the famous Statute of Treasons, which defined the offense of treason under seven heads, the third of which was levying war against the king and the fourth of which was adhering to his enemies and giving them aid and comfort. The framers of the Constitution of the United States preferring not to leave to Congress or the courts the power to define the offense incorporated in the text of the Constitution itself (Art. III, sec. 3) the definition of treason. This section declares that "Treason against the United States shall consist only in levying war against them, or in adhering to their enemies, giving them aid and comfort. No person shall be convicted of treason unless on the testimony of two witnesses to the same overt act, or on confession in open court." It will be seen that this definition embodies parts three and four of the Statute of Edward III but does not embrace the other parts of the statute. The word "only" in the definition, said Chief Justice Chase, was intended to exclude from the criminal jurisprudence of the new republic the odious doctrine of constructive treason. Under this definition only two classes of acts are treasonable: levying war against the United States and adhering to its enemies, giving them aid and comfort. The Supreme Court has interpreted the first part of the definition to mean that in order to constitute treason there must be an actual levying of war, that is, there must be a body of men actually assembled for the purpose of effecting by force a treasonable purpose. When this condition exists all those who perform any part, however minute or however remote from the scene of action, and who are actually leagued in the general conspiracy are to be considered as traitors. But if there is an actual assemblage for this purpose it is not necessary that actual violence should take place in order to make the assemblage treasonable. The Federal courts have even held that an insurrection of armed men, the object of which was to suppress the excise offices and to prevent by force and intimidation the execution of an act of Congress was levying war and as such was treason. It is more difficult to state the elements of the crime of "adhering to their enemies, giving them aid and comfort." Mr. Justice Field of the United States Supreme Court during the American Civil War charged a grand jury that "Whenever overt acts have been committed which, in their natural consequences, if successful, would encourage and advance the interests of the rebellion, in judgment of law aid and comfort are given."

In the recent case of Sir Roger Casement in England it was said in the indictment that "if a British subject commits an act which weakens or tends to weaken the power of the king and of the country to resist or to attack the enemies of the king and the country, that is in law the giving of aid to and comfort to the king's enemies."

Among the specific acts which have been held to come within the purview of the phrase quoted above are the selling of goods to and buying goods from the enemy government or its agents or forces; the communication of information to him with the purpose of aiding him; joining or offering to join his forces; delivering up of prisoners to him; trading with the enemy under certain circumstances; acts which tend and are designed to defeat, obstruct or weaken our own arms; advising, inciting and persuading others to give aid and comfort to the enemy, etc. Under the Constitution the testimony of at least two witnesses to the overt act is necessary to convict. An "overt" act is one which is of a character susceptible of clear proof and not one which rests on mere inference or conjecture. But an overt act may consist of words as well as deeds and while the testimony of two witnesses to the act is necessary to convict, it is not necessary to prove the intention. Nor is it necessary that the treasonable act should have been successfully performed. Thus the purchasing of a vessel, guns and ammunition for the purpose of using them in aid of a rebellion against the United States has been held to be a treasonable act.

Although treason is popularly regarded as a breach of allegiance it is now well settled that an alien as well as a citizen may commit treason, since if domiciled in the country he owes it a local and temporary allegiance in return for the protection which he receives. Although the Constitution defines treason it does not prescribe the punishment but confers that power on Congress, subject to the condition that no attainder of treason shall work corruption of blood or forfeiture except during the life of the person attainted. This limitation as to pun-

ishment was intended to prohibit the unjust early practice in England of cutting off the right heirs to inherit the property of a traitor. Under the provision of the Constitution the property of the traitor may be confiscated only during his lifetime; upon his death his property reverts to his lawful heirs. In 1790 Congress provided that any person convicted of treason should suffer death but the statutes as revised in 1909 provide that the court in its discretion may substitute imprisonment at hard labor for not less than five years and a fine of not less than $10,000.

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TREASURE ISLAND, Robert Louis Stevenson's earliest novel, is a vivid tale of pirates, adventure and buried treasure that brought the author his first taste of popular applause. Frankly designed for boys, its appeal to younger readers was as immediate as it has proved enduring; yet distinguished men sat up late to finish it; Andrew Lang spent over it "several hours of unmitigated bliss," and wrote, "This is the kind of stuff a fellow wants. I don't know, except Tom Sawyer and the Odyssey, that I ever liked any romance so well." The story was written and read a chapter at a time for the entertainment of Stevenson's stepson, Lloyd Osbourne, then a 12-year old schoolboy, to relieve the tedium of a rainy vacation, and grew out of a map that the author had drawn and labeled "Treasure Island." Stevenson himself says, "As I pored upon my map of Treasure Island, the future characters of the book began to appear there visibly among imaginary woods; and their brown faces and bright weapons peeped out upon me from unexpected quarters, as they passed to and fro, fighting and hunting treasure, on these few square inches of a flat projection." The story appeared serially, 1881–82, in *Young Folks,* as 'The Sea Cook,' taking that name from the more peaceful vocation of its splendid villain, "Long John Silver." The permanent title, 'Treasure Island,' was given to the tale on its publication as a book in December 1883. It has been widely translated and successfully dramatized.

ARTHUR GUITERMAN.

TREASURE TROVE, in English law, a name given any coin, gold or silver plate, or bullion found hidden in the earth or other private place. In Great Britain such treasure belongs to the Crown and any person finding it is bound to give information of the fact to the officers of the Crown. Failing to do so he is liable to fine or imprisonment. The Crown, on having treasure trove delivered up to it, is in the habit of paying to the finder its full value, in order that persons may not be induced to conceal such discoveries with a view to the profit, whereby many interesting remains of antiquity might be lost. The term is not often used in the United States and has not any technical legal meaning.

TREASURY, The Little ('Il Tesoretto'), an allegory in rhymed heptasyllabic couplets, was written probably in 1262 and not later than 1266 by the Italian scholar Brunetto Latini during his stay in France. This early mediæval poem, one of the oldest specimens of Italian didactic verse, antedates slightly the author's French encyclopedia 'Li Livres dou Trésor,' and can be considered an abridged Italian preliminary draft intended for a less cultured public. The immediate inspiration of the 'Tesoretto' was the first part of the famous contemporary French allegory, 'Le roman de la rose.' In his compilation which contains not quite 3,000 lines, Brunetto on his return from an embassy to Alfonso X of Castile learns that the Guelphs had been driven out of Florence (1260). Saddened by this news from his native town, he loses his way in a forest where he encounters Nature represented as a sovereign deity who undertakes his guidance and instruction. Then follows a typical medieval allegory with the usual personification of the various virtues, etc. Saved by Ovid from Pleasure (Love), Brunetto enters Montpellier, confesses to a friar, changes his mode of life, then continues his journey and reaches Mount Olympus where he engages in converse with Ptolemy. The poem breaks off just as the philosopher is about to reply in prose. Artistic value the work has not. Brunetto, learned and scholarly for his time, was no poet. The versification is of an inferior order. As Adolfo Bartoli well puts it, the couplets pass by like a procession of monks, all alike, without expression, without life. There is no characterization; the excess of detail, the minuteness of portrayal render the figures lifeless abstractions. The value of the poem lies, however, in the high moral tone that pervades the work, in the linguistic significance of this old example of Italian verse, in the code of knightly virtues so well set forth and above all in the influence over later writers, in particular, Dante. Consult Sundby, Thor, 'Della vita e delle opere di Brunetto Latini' (Italian edition, Florence 1884); Gaspary, Adolf, 'The History of Early Italian Literature' (English trans. by H. Oelsner, London 1901); Dole, Nathan H., 'A Teacher of Dante' (New York 1908). A critical edition of the 'Tesoretto' was published by B. Wiese in the *Zeitschrift für romanische Philologie* (Vol. VII, 1883).

ALFRED G. PANARONI.

TREASURY DEPARTMENT. The Treasury Department is that branch of the government service which has control of the national finances. It is under the direction of the Secretary of the Treasury, who is appointed by the President, with the consent of the Senate, and among cabinet officers, ranks second in the line of succession to the Presidency. His salary is $12,000 a year. He prepares plans for the improvement of the revenue and superintends its collection; directs the forms of keeping and rendering the public accounts and of making returns; grants warrants for all disbursements authorized by appropriations and submits to Congress, annually, estimates of the probable receipts and expenditures of the government for the ensuing year. The construction and care of public buildings and the administration of the coast guard and public health service are under his direction. He is chairman, ex-officio, of the Federal Reserve Board. Each of three assistant secretaries performs such a part of the duties of the secretary as he may prescribe.

The comptroller of the currency exercises

general supervision over the organization and regulation of national banks throughout the United States, including Alaska and Hawaii.

The treasurer receives and disburses all public moneys that may be deposited in the treasury at Washington, in the sub-treasuries and in the national bank depositories and makes authorized advances to disbursing officers.

The register signs all bonds of the United States and keeps records of the outstanding principal and interest of the bonded indebtedness of the government.

The designing, printing and finishing of all paper money, bonds and postage, customs and revenue stamps are done in the Bureau of Engraving and Printing, where also are prepared the pension certificates, commissions, disbursing officers' checks and portraits authorized by law, of deceased members of Congress.

The director of the mint has charge of all matters relating to the coinage. Tests of the weight and fineness of the pieces struck at the mints are made in his assay laboratory. The mints are located in Philadelphia, San Francisco, New Orleans, Carson and Denver.

The secret service is charged specifically by statute with the detection and arrest of counterfeiters and the guarding of the President of the United States.

The division of the Treasury Department which supervises the work of collecting the customs duties and of guarding against smuggling is a highly specialized organization. The country and its territorial possessions are divided into customs districts, in each of which places are designated where goods may be entered or delivered, according to law. Collectors of customs are required to execute and carry into effect all instructions of the Secretary of the Treasury in regard to the customs-revenue laws. In addition to the regular employees of this service, special agents are employed in foreign countries as well as in the United States, whose duties are along the lines of the detection and prevention of frauds against the revenues of the United States arising from customs.

The commissioner of internal revenue supervises the collection of internal revenue taxes and the enforcement of the laws related to them.

The comptroller of the treasury is really the chief of the auditing system of the Treasury Department and his decision is conclusive in the executive branch of the government. He is charged with the duty of revising accounts upon appeal from settlements made by auditors. Upon the application of disbursing officers or the head of any executive department, the comptroller is required to render his advance decision upon any question involving a payment to be made by them or under them, which decision, when rendered, governs the auditor and the comptroller in the settlement of the account involving the payment inquired about. He is required to approve, disapprove or modify all decisions by auditors making an original construction or modifying an existing construction of statutes and certify his action to the auditor whose duties are affected thereby. It is his duty to countersign all warrants authorized by law when signed by the Secretary of the Treasury.

The public health service conducts scientific investigations of contagious and infectious diseases and matters relating to the public health. The surgeon-general is required by law to call a conference of State and Territorial boards of health or quarantine authorities each year and additional conferences when, in his opinion, the interests of the public health demand such action. He has the care of sick and disabled seamen at 23 marine hospitals and 123 other relief stations. He enforces and regulates the national quarantine laws and has supervision over the medical officers detailed in the consular offices at foreign ports and those engaged in the mental and physical examination of arriving aliens.

The principal duties of the coast guard are rendering assistance to vessels in distress and saving life and property; destruction and removal of wrecks and other dangers to navigation; extending medical aid to sailors engaged in deep-sea fisheries; protection of the customs-revenue; operating as a part of the navy in time of war, when the President shall direct; enforcement of the laws relating to quarantine and neutrality; suppression of mutinies on merchant vessels; protection of game and the seal fisheries of Alaska and the enforcement of the sponge-fishing laws.

The supervising architect has charge of the erection of public buildings, selecting the sites, securing the necessary cession of jurisdiction from the States affected, preparing the drawings, estimates and specifications and superintending the construction thereof. He is charged with the care and maintenance of all Federal buildings outside of Washington.

While the Federal reserve board is actually an independent body, its work is closely allied to that of the Treasury Department and its headquarters are in the Treasury building in Washington. Its functions are to exercise supervision over the affairs of the Federal reserve banks, issue Federal reserve notes to member banks and in general to perform the various banking functions described in the Federal Reserve Act. The support of the board is derived from the several reserve banks, through assessments levied semi-annually, pro rata. It has full power to appoint its own employees and to regulate the conditions of their employment. Both the Secretary of the Treasury and the comptroller of the currency are members of the Federal Reserve Board.

TREAT, trēt, **Mary Lea Adelia Davis Allen**, American naturalist: b. Tompkins County, N. Y., September 1835. She was married to Joseph Treat in 1863, and has published 'Chapters on Ants' (1879); 'Home Studies in Nature' (1885); 'My Garden Pets' (1887); etc. She is also joint author of 'Through a Microscope.'

TREAT, Robert, American soldier and statesman: b. Pitminster, near Taunton, Somerset, England, 1622; d. Milford, Conn., 12 July 1710. He came to Massachusetts in 1635, removed to Wethersfield Conn., in 1637, settled at Milford in 1649, was assistant to the governor in 1657–65, represented Milford in the general assembly of New Haven colony in 1653–59, and from 1659 to 1664 was, with a year's exception, a member of the governor's council. Repeatedly elected magistrate of Milford, he was ordered at the Restoration to apprehend Whalley and Goffe, the regicides, who

were secreted there; but he appears to have postponed issuing a writ of search until they were beyond his jurisdiction. He was again made a deputy in 1663, but in 1666 went with a company of planters to found Newark, N. J. (q.v.), where he remained until about 1671, when he returned to Connecticut, becoming in 1673 a member of its council of war. In 1675, with the rank of major, he commanded the Connecticut force which defeated the Indian besiegers of Springfield and Hadley, Mass.; and in November of that year was appointed second in command to Governor Winslow in the New England forces in the field. (See COLONIAL WARS IN AMERICA, *King Philip's War*). For his services he was made deputy-governor of Connecticut in 1676. In 1683, upon the death of Governor Leete (q.v.) he became governor. In December 1686 Andros (q.v.) landed at Boston, with commission as royal governor of all New England, and he quickly set about attempting to abrogate the Connecticut charter. The general assembly met in October 1687, and Andros appeared with about 60 regular troops to enforce his demand. He did not get the charter; why, the records prudently omitted to explain. Tradition has an account (see CHARTER OAK), for the impeachment of which Johnston fails to discover good grounds. Treat yielded to superior force, and Andros' commission having been read, was made a member of the council for New England. After the deposition of Andros in 1689, Treat resumed his duties, and continued in office until 1698, when he refused re-election. For 10 years more, however, he was deputy-governor. Consult Johnston, 'Connecticut' ('American Commonwealths' series, 1887).

TREATIES. A treaty is an agreement or compact between two or more independent sovereign states for the settlement of their current interests or controversies, or for the purpose of increasing, modifying or determining their respective rights, duties and obligations, between themselves, or between each, and the subjects of the other. A treaty is somewhat similar to a contract in private law, an important difference being that its enforcement depends largely on the good faith of the contracting parties, and the fact that in case of a dispute the parties can settle it in only two ways; by agreement, or by an appeal to force. The term *treaty* includes various transactions between states, such as treaties of peace, conventions and agreements of a political or commercial character. The term is, however, usually restricted to the more important international agreements of a general character — to those covering several subjects such as a treaty of alliance, peace or commerce.

Treaties as a Source of International Law. — Treaties are an important source of international law, for a special agreement between two nations may work so well that other nations will enter into such an agreement, and the principle or practices involved may finally be accepted by all nations as a part of the common law of nations. Or a considerable number of important nations may declare for a new set of rules binding on themselves, which later may be adopted by others, as for example, the Declaration of Paris made in 1856, providing for new maritime rules referring to privateering, blockades, contraband, etc. Treaties entered into by a large number of powers, which redistribute territory, make or unmake dynasties and states, and set up a new balance of power, are also important sources of international law. Examples are the Treaty of Westphalia, 1648; Peace of Paris, 1763; Congress of Vienna, 1815, and the Peace of Versailles, 1919.

The Right to Make Treaties. — The right to make a treaty is one of the essential and determining attributes of sovereignty. Semi-sovereign or dependent states are easily recognized because of the fact that this right has been abridged or destroyed. Even sovereign and independent states may voluntarily restrain or modify this faculty by treaties of alliance or confederation with other states. Dependent states, restricted with respect to their right to make important international agreements, often retain power to make, unrestricted, certain treaties of a commercial character, or an extradition or naturalization treaty. Members of federal states are usually forbidden to make independent treaties, except those of a minor character. The States of the United States are forbidden by the Constitution to enter into treaty relations with foreign states or make agreements with each other except by the consent of Congress.

The treaty-making power, or the agent to whom the power is given to negotiate a treaty varies in individual countries. Ordinarily, in monarchical countries, it is vested in the Crown, but the approval of the legislative body may be necessary for ratification. In other words, power to negotiate and power to ratify are two separate steps. In states having a republican form of government the power to negotiate is usually exercised by the executive council. In the United States the treaty-making power is vested by the Constitution in the President, with the advice and consent of the Senate, two-thirds of the members present concurring. The preliminary negotiations leading up to the treaty and the drafting of the instrument, have in practice been in the hands of the President, usually acting through the Secretary of State, or through special envoys. The framers of the Constitution probably intended that the Senate should share in these preliminary negotiations, by giving advice as well as consent. The House of Representatives also may have a share in the treaty-making power, if legislation is necessary to carry it into effect, in which case its consent must be obtained.

The ambiguity with respect to the exact powers of the Senate in giving advice has never been settled. Washington personally appeared before the Senate on one occasion (1789) and asked its "advice" and consent respecting a proposed treaty with the Southern Indians. The Senate voted on seven specific questions respecting the proposed negotiations, favoring only a part of those proposed. Washington later, on several occasions, sought the advice of the Senate through special messages regarding proposed treaties, before negotiations were opened. President Jackson in a message of 6 May 1830 sought the advice of the Senate respecting the conclusion of a treaty with the Choctaw Indians in accordance with certain propositions therewith submitted. Presidents

Polk, Buchanan, Lincoln, Johnson and Grant sought the advice of the Senate respecting various treaties, conventions, etc. Nevertheless, the cases mentioned are exceptional. The Senate has on various occasions since 1883 advised the President by resolution concerning the negotiations of treaties by the executive, but such resolutions are not mandatory, and the right to adopt them is not dependent upon the treaty-making power. The President more commonly consults with individual members of the Senate, especially those on the Committee on Foreign Relations, to which all treaties are referred in the Senate.

The practice prior to 1815 was to submit to the Senate, for confirmation, the names of commissions designated to negotiate treaties, but since this date this course has been exceptional. Treaties have, with few exceptions, been negotiated through the Secretary of State, the regular diplomatic representatives and consular officers, or special agents, commissioned by the President, without special confirmation for this purpose by the Senate. A resolution was introduced into the Senate against this practice as early as 1833—that of appointing diplomatic agents to foreign countries by the President alone, without the advice and consent of the Senate. But on motion of Mr. Webster it was tabled. Again in a resolution of 9 Jan. 1883, consenting to a treaty with Korea, the Senate declared that it did not by that act admit or acquiesce in any right or constitutional power of the President to authorize any person to negotiate treaties with a foreign power, unless appointed and commissioned by and with the advice and consent of the Senate, except in the case of a Secretary of State or diplomatic officer appointed by the President to fill a vacancy during the recess of the Senate. The executive has, however, recognized no limitation in this respect, and special agents are employed including the famous case of President Wilson himself acting as one of the negotiators to the Peace of Versailles of 1919.

Respecting the question of giving consent, there has been no doubt and the Senate has rejected numerous treaties presented to it for ratification. Since the Senate has not usually been consulted with respect to the subject-matter of a treaty, it has exercised its co-ordinate power in treaty-making by means of amendments. The Senate by thus withholding action, may compel the President to enter into new negotiations again, in order to incorporate into the treaty its wishes. It may give its consent with an amendment. The President must then try and induce the other party to the treaty to accept the amendment. If such amendment proves unacceptable, then no treaty results. The President alone has the power to negotiate treaties, and he is the sole organ of the nation in its external relations, and its sole representative with foreign nations, except so far as he may delegate that power to some agent. Ratifications are exchanged only by virtue of special powers conferred on duly authorized agents, by the President, after the advice and consent of the Senate has been secured, two-thirds of the senators present concurring. The President may withhold from the Senate a treaty already negotiated. He may submit it to the Senate with a recommendation for an amendment, or a request that no amendment be made. The President may refuse to ratify a treaty even though the Senate has advised ratification. He may even withdraw a treaty from consideration by the Senate, in order to effect changes, or to terminate proceedings thereon. Certain agreements may be made by the President without the advice and consent of the Senate. While not technically treaties, such agreements are often their equivalent. It has been well stated that all treaties are agreements, but all international agreements and understandings are not "treaties." For example, President Monroe, through the acting Secretary of State, Mr. Rush, entered into an agreement 28–29 April 1817, with Great Britain, through the British minister, for the limitation of the naval forces to be maintained by the two governments on the Great Lakes. Nearly a year later the Senate declared, in answer to the request from President Monroe, that this was an arrangement the President was competent to enter into by powers vested in him by the Constitution, without the advice and consent of the Senate. Similar agreements have been made by our Presidents with sovereign nations, at various times, without the advice and consent of the Senate, respecting preliminary articles for peace treaties, reciprocal crossing of international boundary lines by troops of the respective countries in pursuit of bands of Indians, and for putting into execution treaty stipulations, etc.

The House of Representatives is not mentioned in the Constitution as one of the parties that must be consulted in making a treaty. But a treaty involving the payment of money, for example, can only be carried into effect by an act of Congress. Therefore, in such a case the consent of the House to a treaty must be secured before final ratification, if its execution is to be made certain.

How Treaties are Made.—The actual preparation of important treaties involving several states is usually the work of ministers, or representatives, selected for the special purpose, with definite powers to act on behalf of the government they represent. Rules of procedure are drawn up, the various representatives of the states interested are given an opportunity to submit projects or arguments affecting their interests, and the proceedings are put in writing and submitted to the various representatives for approval. The treaty is usually drawn up in the form of articles, stating who are the contracting parties, the purpose or object of the treaty, and the stipulations agreed on, such as boundaries, indemnities, terms of ratification.

Ratification.—Treaties must be ratified by the sovereign authority of the states which are parties to their operation in order to be binding. This act is completed through the exchange of written instruments identical in form and signed by persons given such powers by the supreme treaty-making power. Treaties may fail of ratification notwithstanding the fact that the minister or commissioners may have followed their instructions exactly. New conditions and the great magnitude of the interests of a nation make it necessary that the final consent shall rest in the nation itself after a review of the work of its agents.

Powers.— The nature and the extent of the treaty-making power includes the power to make peace, acquire and dispose of territory, recognize the independence of new states, change boundaries, guarantee territorial integrity of other states, provide for neutrality of countries, grant special privileges with respect to trade and commerce, and in fact consummate any other acts not inconsistent with sovereignty.

Validity.— The validity of a treaty depends upon several matters. Freedom of consent is indispensable to the validity of every agreement. But this does not mean that an engagement entered into by a nation under such duress as is implied by the defeat of its military forces, or the occupation of its territories, gives the conquered country the right to say that its consent was obtained by force. Nor does inequality in the conditions of a treaty form a sufficient reason for refusing to execute it. Treaties which violate fundamental principles of modern international policy are voidable; for example, acquiring of proprietary rights over the open sea, or a compact to re-establish the slave trade. The contracting parties must of course possess the full power to enter into treaty engagements, and the agents must not exceed the powers laid down in their instructions. The formal consent of the parties must be given. The subject matter of the treaty must be such that it is physically or morally possible of execution. For example, a clause involving a violation of the sovereign rights or power of a third state is invalid. Treaties properly entered into are binding, and are not affected by changes of government, and obligations involved may either release the other party or even be a just cause for war.

Kinds of Treaties.—Treaties are of various kinds and have been classified in different ways. There are special and general treaties. When a compact is put into effect and the object has been attained so that there is nothing further to be settled by future action, it is called an "executed" convention. Such compacts are binding on states regardless of changes of government. An example would be the settlement of a boundary question by treaty. All treaties which stipulate the performance of successive acts, executory treaties, to be continued through a period of time, limited or unlimited, fall into the second class.

Treaties of alliance, guarantee, commerce, arbitration, peace and the like, involving the performance of successive acts, are the chief means of regulating the intercourse of modern states. A treaty of alliance is an agreement of two or more states, for the purpose of securing their mutual desires. It may be offensive or defensive, or both; temporary or permanent, equal or unequal. Two states may guarantee the continuation of a certain state of affairs in a third state. Treaties of guarantee are entered into to secure the observance and execution of other treaties or the maintenance of certain existing conditions, such as the permanent neutrality of a state, for example,— Switzerland or Belgium, or the free navigation of a river or the neutrality of a ship canal. Treaties of commerce regulate the conditions of trade, and define the rights and duties of commercial intercourse, such as the exchange of raw materials and manufactured articles. Reciprocity treaties are compacts requiring mutual observance of certain duties or obligations. These involve such subjects as extradition, naturalization or copyright; for these are reciprocal on the subject named. Reciprocity treaties are, however, ordinarily thought of as commercial in character. They provide for the admission of certain products of each state into the ports of the other, at special rates, or duties, less perhaps than other countries pay, or without payment of any duty. Most treaties of arbitration are agreements between sovereign states to submit their disputes to tribunals or to a board of arbitrators, whose final awards they bind themselves to abide by. General arbitration treaties commenced to be entered into quite frequently from the middle of the 19th century, and have in recent years become very popular. The most important influence toward international arbitration of disputes was the calling of The Hague Peace Conferences of 1899 and 1907. The first provided for a number of conventions and declarations, one especially — the "Convention for the pacific settlement of international disputes" which was agreed to by the delegates of the 26 states represented, of which the United States was one. At the second conference 44 states were represented, and 13 conventions were agreed upon, the first of which dealt with the pacific settlement of international disputes, being a revision of that of 1899 with numerous additions.

Treaties of peace are similar in form to other treaties but the contracting parties do not enter into them on equal terms. They are nevertheless binding even though one of the parties has no real freedom of consent, and in fact may be compelled to sign a treaty under duress. Nearly every treaty of peace confers advantages on one side and imposes disadvantages on the other. In one sense the peace negotiation is a kind of extension, in another plane of conflict, of the military operations, in which the victor can threaten to resume hostilities, if his terms are not accepted. This kind of pressure is not exactly the same as duress. The defeated party may not consider that the use of such pressure gives him any right to violate his agreement; for he chooses to sue for peace and accept some hardships, in order to avoid the much greater evil of subjugation or annihilation. The victor might refuse to suspend hostilities until this event was consummated, with the result that there could be no treaty of peace. We may consider that the right of the victor to force the defeated party to accept his terms of peace is in the nature of a compensation for not pressing the victory to the extreme limit possible. Thus a treaty of peace is a compromise of necessity, unlike most other treaties which are equal transactions.

Objects Sought.— The constituent elements of treaties of peace vary considerably from other treaties because of the purposes and the condition of the belligerents. The fundamental object of a treaty of peace is first, to put an end to the war; secondly, to settle differences that produced it; thirdly, to settle whatever new differences may have arisen in the course of the hostilities. Two classes of articles may be distinguished, general and special. In the first class are those that relate directly to the cessation of the war and resumption of peace;

for example, provisions for the evacuation of territory, restoration of property captured, liberation of prisoners, the revival or abrogation of treaties concluded before the war. The special articles are those that relate to the essential points at issue — the terms on which peace is to be re-established, for example, the principal demands imposed by the victor on the vanquished, such as the cession of territory or the payment of indemnities, and the articles specifying the conditions and methods of carrying the main articles into effect. Miscellaneous articles deal with subjects peculiar to each individual treaty, such as provisions for demobilization, destruction of fortresses, rights of navigation or trade, establishment of new states, etc. Secret articles are sometimes agreed upon which do not appear in the treaty made public. Such articles may modify or suspend certain clauses of the open treaty, or even make new provisions, which are kept secret in order perhaps to avoid offending their states, or even to prevent opposition to the treaty by subjects of the parties who are signatories to the treaty. The date when the treaty is in full effect, especially treaties of peace, is not always easy to determine. The date when a treaty is signed does not necessarily show when the terms begin to operate. But the signing of the treaty marks the latest date for ceasing hostilities, unless otherwise provided for. The date when the treaty as a whole begins to operate, when peace is definitely and finally established, when the new status or position of the states begin, depends upon the date when ratifications have been completed and exchanged by all the parties signatory to the treaty, unless some other date is named in the treaty. The exact date of the operation of certain clauses may be indefinite or indeterminate, because of the operation of other clauses. For example, military occupation of the enemy's territory might continue for years, until the payment of an indemnity was completed.

Special Agreements.— There are a great variety of international agreements and acts involving matters of less importance than treaties that have been given special names. Those applied to the more special or limited subjects are protocols, notes, memoranda, declarations, conventions, congresses, cartels, etc. The word "protocol" is used in different ways, but commonly it means the preliminary document recording the fundamental principles or the particular points on which an agreement has been reached, thus serving as the basis for the final instrument. Notes are résumés of diplomatic conversations. Memoranda define in detail certain points on which misunderstanding might arise. Declarations are signed statements of principles which states intend to observe in their relations to one another. Conventions and congresses are bodies convened to discuss important questions of interest to several states, or for the purpose of settling questions of controversy. The conclusions may result in a treaty, or may be expressed in a statement of international policy, like the declaration of Paris, 1856. Examples of congresses on this continent are those of Panama, 1826, and those called by the United States known as Pan-American Congresses, which have convened at various times since 1889. Cartels are agreements entered into in time of war for the exchange of prisoners. They are the official acts of generals or admirals with the express or presumed consent of their governments. Capitulations are agreements entered into in time of war by commanders of armies or navies for the surrender of forts, armies, etc. Such action is subject to the approval of the government of the commander.

Interpretation of Treaties.— Treaties are subject to varying interpretations, because all possible cases that might arise cannot be foreseen. General terms applied to particular questions are the occasion for disputes concerning the meaning of the language used. European treaties are generally written in French. If England and the United States are parties they are drawn up in both languages, in parallel columns. The rules of interpretation include the following which are commonly recognized as valid. Interpretation must be mutual; only one true meaning can be given to a clause of a treaty; words are presumed to have been used in their usual sense; in case a treaty is in two languages, each document is regarded as original, and the sense of the treaty is to be drawn from them collectively; matters expressed in detail have precedence over those expressed in general terms; the treaty is to be regarded as a whole, its context and spirit, and each part with reference to others. The spirit of the treaty rather than the letter should govern in cases where literal interpretation fails to yield reasonable sense. Clauses favoring justice and humanity are to be construed more broadly than those involving cruelty or hard conditions. In general, the interpretation may be drawn from the connection and relation of the different parts; and with the purpose of keeping the treaty in operation, rather than of making it inoperative through disagreement as to details.

Treaties cease to be operative, or are terminated, under the following conditions: by mutual consent of the contracting parties; when terms upon which the treaty was conditioned cease to exist; when either party violates stipulations; when one party withdraws having the option to do so; when the performance of the treaty becomes impossible, as in the case of a triple alliance, with war breaking between two of the members, and the third state finds itself unable to fulfil its obligations; when a new state of affairs arises, overturning an existing state, the latter being the basis of the treaty; when the stipulations of the treaty limit the period of its operation. War may suspend the operation of a treaty, but not in all cases; for example, one entered into to amend the rules of international law, or one guaranteeing the neutrality of a state.

Renewal.— It is the usual, but not uniform practice, for the parties to agree in the treaty of peace to renew treaties existing between them at the outbreak of the war. Even without express stipulation as to renewal, it is generally agreed that certain treaty obligations are not annulled by war, but only suspended by it. For example acts previously done or rights already transferred under the sanction of a treaty are not nullified by a mere state of war; for example, a treaty in which territory has been ceded and boundaries established. Such

rights are, however, subject to the law of conquest.

Enforcement.— The enforcement of treaties is a subject of great importance, but also of great uncertainty. Unlike private contracts, where either party may compel the submission for a disputed interpretation to an independent tribunal for adjudication, treaties depend upon the good faith and honor of the contracting parties for their enforcement, and their willingness to agree. In case of disagreement either party determines for itself the nature of its obligations, and the only alternative is recourse to force, or denunciation of the treaty by the aggrieved party. Since the contracting parties are sovereign states no tribunal can exercise authority over them without their mutual consent. Various methods to insure the execution of treaties have been used, such as giving hostages, pledges, a guarantee by a third state, and military occupation of a territory belonging to the party who is required to fulfil certain demands within a stipulated time. The agencies for enforcement are the legislature, executive, army and navy and the courts. The first four are more important in the case of treaties of peace, commerce, etc., and the last in cases of naturalization and extradition.

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TREATIES, Indian. In a limited sense the Indian tribes of North America have always been treated by the government to which they were subject as foreign nations. Before the Revolution the king maintained diplomatic intercourse with those tribes residing within the limits of the territory claimed by Great Britain, and after the colonies became independent the relations between them and the Indians continued to be regulated through formal treaties, negotiated with their chiefs and approved by the tribe. The Articles of Confederation made provision for maintaining diplomatic intercourse with the Indian tribes by vesting in Congress the power to negotiate treaties with them. By the Federal Constitution the treaty-making power was vested in the President, and from the foundation of the government until a recent day the relations between the United States and the several Indian tribes occupying the territory embraced within the limits of the Union were regulated exclusively through regular diplomatic channels. These treaties were negotiated by commissioners or agents with the chiefs on terms of theoretical equality, and were ratified by the Senate according to the usual methods. Considering the actual dependent status of the Indians there was an element of absurdity in the practice of regulating the relations between them and the government to which they were subject, through diplomatic channels. Besides, this method proved inconvenient and at times embarrassing to the government. Finally by an act of Congress passed in 1871 it was declared that thereafter Indian affairs should be regulated directly by Congress and not by treaty. Since 1871, therefore, no treaties have been concluded with Indian tribes, but those existing at the time of the act were continued in force. The majority of the treaties between the United States and the various Indian tribes have been treaties of friendship or of cession, those of the latter class providing for the extinction of the "possessory right" of the Indians to the lands which they occupied and in some cases for the removal of the Indians to the territory especially set apart for their use west of the Mississippi River. Among the more important and best-known Indian treaties were those of Fort Stanwix of 1784 with the Iroquois, providing for the cession to the United States of western lands claimed by them; the Treaty of Greenville of 1795 with the Wyandots, Delawares, Shawnees, Ottawas, Chippewas, Pottawattomies, Miamis, Eel Rivers, Weas, Kickapoos, Piankeshaws and Kaskaskias by which a large part of the territory embraced in the present State of Ohio was ceded to the United States; the treaty of 1826 with the Creeks for the cession of lands in Alabama and Georgia; various treaties between 1791 and 1835 with the Cherokees for the cession of lands occupied by them in Georgia; the Treaty of Dancing Rabbit Creek of 1830 with the Choctaws for the cession of lands in Mississippi, and the Treaty of Pontotoc Creek of 1832 with the Chickasaws for the relinquishment of their claims to lands in the same State. Between 1828 and 1832 treaties were made with the so-called five civilized tribes, the Creeks, Cherokees, Choctaws, Seminoles and Chickasaws, as well as several other tribes of lesser importance, providing for their removal to the Indian territory west of the Mississippi. These treaties usually contained provisions for the payment of a lump sum to each tribe in consideration of the relinquishment of its lands, for the payment of annuities to the chiefs and the promise of various articles such as rifles, hoes, kettles, blankets and tobacco to each Indian who emigrated. Provision was also generally made for means of transportation to the Indian Territory and for supplying them with wagon-makers, wheelwrights, blacksmiths, millwrights, etc. Heads of families desiring to remain and become citizens were usually allowed to do so and were given 160 acres of land.

Down to 1837, at which time most of the Indians formerly residing east of the Mississippi River had emigrated to the Indian Territory,

the government had concluded 349 treaties with 54 Indian tribes distributed as follows:

With the Appalachicolas	2
With the Caddoes	1
With the Omahas	2
With the Cherokees	18
With the Chickasaws	8
With the Chippewas	21
With the Choctaws	11
With the Comanches	1
With the Creeks	12
With the Crows	1
With the Delawares	16
With the Eel Rivers	7
With the Floridas	1
With the Foxes	10
With the Hunkpapas	1
With the Illinois	1
With the Ioways	5
With the Kanzas	3
With the Kaskaskias	6
With the Kickapoos	11
With the Mahas	2
With the Mandans	1
With the Menomonees or Menominies	6
With the Miamis	10
With the Minnetarees, or Belantse-Etas	1
With the Missouris	4
With the Mohawks	1
With the Muscogees	2
With the Oneidas	1
With the Osages, Great and Little	7
With the Ottawas	19
With the Ottoes	5
With the Pawnees	6
With the Peorias	2
With the Piankeshaws	8
With the Poncarars	1
With the Poncars	1
With the Pottawattomis	38
With the Quapaws	4
With the Ricaras	1
With the Sacs	12
With the Seminoles	2
With the Senecas	12
With the Seven Nations of Canada	1
With the Shawnees	14
With the Siounes	1
With the Sioux	10
With the Six Nations of New York	4
With the Tetons	2
With the Weas	8
With the Winnebagoes	6
With the Wyandots	14
With the Yanctons	3

For the full text of these treaties with the date of the conclusion and ratification of each, together with the names of the commissioners and signatories consult 'Treaties Between the United States and the Several Indian Tribes from 1778 to 1837' (Washington 1837); consult also Weil, 'Legal Status of the Indian.'

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TREATIES OF THE UNITED STATES WITH FOREIGN NATIONS. The United States has always been a treaty-making country, as well as a treaty-keeping country. From the earliest days of its history as a nation, when as a new republic, flushed with victory and hopeful for the future, it appealed to the great foreign powers for recognition, the policy of almost every Congress has been to enter into such agreements, and there has been scarcely a Secretary of State who has not realized the necessity of devoting his energies to engendering such sentiments of mutual confidence and friendliness between the United States and other governments. Among the agreements thus established are the reciprocity treaties which have been a bone of contention among American statesmen for more than a century. Thomas Jefferson, while Secretary of State during Washington's first administration, urged upon Congress the adoption of such a reciprocity policy in regulating the customs and commerce of the United States with other nations:

> "As to the commerce," he said, "two methods occur: First, by friendly arrangements with the several nations with whom these restrictions exist, or, second, by the separate act of our own legislature for counteravailing their effect. There can be no doubt that, of the two, the friendly arrangement is the most eligible."

From Jefferson to McKinley, a period which represents practically the entire history of the United States, there have been few occasions when this sentiment has not been supported by some of the greatest men in the American political world, and the success of the reciprocity movement, so far as this country at least is concerned, undoubtedly inspired the last remarks of President McKinley. A few minutes before he was murdered he declared:

> Reciprocity treaties are in harmony with the spirit of the time. If some of our tariffs are no longer needed for revenue, or to encourage and protect our industries at home, why should they not be employed to extend and promote our markets abroad.

In 1909 the only countries with which the United States had no treaty were Abyssinia, Monaco and Montenegro; and those with which no treaties of peace, amity and commerce were established were Egypt, Rumania and Salvador. Among the most important treaties to which the United States has been a party are the various international agreements which have been executed at Geneva, at Brussels, and, since the establishment of the permanent International Court of Arbitration, at The Hague, and the fact that this country is fully in sympathy with the purpose of the court is shown by its anxiety to avoid armed conflict, and the readiness with which it has resorted to the more peaceful methods of arbitration offered by this international tribunal.

The table on following page is a list of the important international acts and conventions in which the United States has been an active participant.

Extradition Treaties.— In 1909 the United States possessed treaties of extradition with over 50 nations, the countries with whom no treaty existed being Bulgaria, China, Costa Rica, Egypt, Greece, Honduras, Korea, Morocco, Paraguay, Persia, Rumania and Siam. Such a treaty had existed earlier with Spain, but was expressly abrogated and annulled by Article XXIX of the Treaty of Friendship and General Relations of 3 July 1902. The crimes and offenses which are extraditable under the treaties in force in 1909 were generally interpreted as follows: Murder, homicide (comprehending assassination, parricide, poisoning, infanticide, manslaughter, when voluntary), or the attempts to commit any of these crimes; abduction, kidnapping or childstealing; bigamy, crimes against railroads, wrongful or wilful destruction or obstruction of railroads which endanger human life; arson; crimes committed at sea; piracy by the law of nations; revolt, or conspiracy to revolt, by two or more persons on board a ship on the high seas against the authorities of the ship; wrongfully sinking or destroying a ship at sea, or attempting to do so; assaults on board a ship at sea with intent to do serious bodily harm; rape,

SUBJECT	Concluded	Proclaimed by United States
Amelioration of the condition of the wounded in time of war	22 Aug. 1854	26 July 1882
Establishment of an International Bureau of Weights and Measures	20 May 1875	27 Sept. 1878
For international protection of industrial property	20 March 1883	11 June 1887
For international protection of industrial property (supplementary convention)	15 April 1891	22 June 1892
For the protection of submarine cables	14 March 1884	22 May 1885
For international exchange of official documents, scientific and literary productions	15 March 1886	15 Jan. 1889
General act for the repression of African slave trade	2 July 1890	2 April 1892
Formation of an international union for the publication of customs tariffs	5 July 1890	17 Dec. 1890
Regulating the importation of spirituous liquors into certain regions of Africa	8 June 1899	6 Feb. 1901
Relative to the pacific settlement of international disputes	29 July 1899	1 Nov. 1901
Relative to the laws and customs of war on land	29 July 1899	11 April 1902
Relative to the launching of projectiles and explosives from balloons, etc	29 July 1899	1 Nov. 1901
For the adaptation to maritime warfare of the principles of the Geneva convention	29 July 1899	1 Nov. 1901
Additional act for the protection of industrial property	14 Dec. 1900	25 Aug. 1902
Final protocol entered into at the conclusion of the Boxer troubles in China in 1900	7 Sept. 1901	.....
Conventions between the United States and other powers on literary and artistic copyrights	27 Jan. 1902	9 April 1908
Arbitration of pecuniary claims	30 Jan. 1902	24 March 1905
International sanitary convention (Paris)	3 Dec. 1903	18 May 1907
International sanitary convention (Central and South America)	14 Oct. 1905	1 March 1909
Repression of trade in white women	18 May 1904	15 June 1908
Exemption of hospital ships from payment of dues	21 Dec. 1904	21 May 1907
International Institute of Agriculture	7 June 1905	29 Jan. 1908
New agreement between China and certain powers for the Whangfu conservancy	27 Sept. 1905	.....
General act of the international conference at Algeciras	7 April 1906	22 Jan. 1907
International Red Cross convention for the amelioration of the condition of wounded of the armies in the field	6 July 1906	3 Aug. 1907
Importation of spirituous liquors into Africa	3 Nov. 1906	2 Dec. 1907
Unification of the pharmacopœial formulas for potent drugs	29 Nov. 1906	.....
International Office of Public Health	9 Dec. 1907	17 Nov. 1908
Second Hague Peace Conference conventions	18 Oct. 1907	28 Feb. 1910
Conventions concluded at the Central American Peace Conference	20 Dec. 1907	.....

offenses against chastity committed with violence; abortion, or procuring abortion; obtaining money or valuable goods under false pretenses (usually an amount in excess of $200); forgery, the utterance of forged papers; forgery or falsification of official acts of government, of public authorities or of courts of justice, of public or private instruments; the use or utterance of the thing forged or falsified; counterfeiting of government acts, seals, stamps, dies and marks of state, or public administration, or the fraudulent use of any of the above-mentioned objects; counterfeiting or altering money, whether coin or paper, the counterfeiting of titles or coupons of public debt, bank-notes or other instruments of public credit, and the utterance, circulation or fraudulent use of same; the introduction of instruments for the fabrication of counterfeit coin or bank-notes or other paper current as money; embezzlement of public moneys committed within the jurisdiction of either party by public officers or depositaries; embezzlement by any person or persons hired or salaried to the detriment of their employers; larceny (usually an amount not less than $200); burglary, defined to be the act of breaking and entering the house of another in the night time, with intent to commit a felony therein; robbery, defined to be the felonious and forcible taking from the person of another of goods or money by violence or by putting the person in fear; theft of horses, cattle or livestock (of the value at least $25); fraud or breach of trust by a bailee, banker, agent, factor, trustee or other person acting in a fiduciary capacity, or director or member or officer of any company, when such act is made criminal by the laws of both countries (usually not less than $200); obtaining by threat of injury or by false devices, money, valuables or other personal property (usually not less than $200); receiving moneys, valuables or other personal property with the knowledge that they have been stolen (usually not less than $200); perjury or subornation of perjury; crimes and offenses against the laws of both countries for the suppression of slavery and slave-trading; mayhem and any other wilful mutilation causing disability or death; bribery.

The United States has treaties, conventions and agreements on the following subjects with the countries mentioned: Peace, amity, commerce and navigation.—Algiers (peace and amity), Argentine Republic, Austria-Hungary (commercial), Belgium (commercial), Bolivia, Borneo, Brazil, Central America, Chile, China, Colombia, Congo (commercial), Corea, Costa Rica, Cuba, Denmark, Dominican Republic, Ecuador, Egypt (commercial), Ethiopia (commercial), France, German Empire (commercial), Great Britain, Greece (commercial), Guatemala, Hanover, Hanseatic Republics, Hawaiian Islands, Hayti, Honduras, Italy (commercial), Japan, Lew Chew, Liberia (commercial), Madagascar, Mecklenburg-Schwerin (commercial), Mexico, Morocco (peace, friendship and protection), Muscat, Netherlands, Nicaragua, Oldenburg (commercial), Orange Free State, Ottoman Empire (commercial), Paraguay, Persia, Peru-Bolivia, Peru, Portugal (commercial), Prussia, Russia (commercial), Salvador, Samoan Islands (commercial), Sardinia (commercial), Serbia (commercial), Siam, Spain, Sweden, Sweden and Norway, Switzerland, Tonga, Tripoli (peace and friendship), Tunis, Two Sicilies, Venezuela.

Trade-marks.—Austria-Hungary, Belgium, Brazil, Denmark (also industrial designs and models), France, German Empire (also patents), Great Britain, Guatemala (also patents), Italy, Japan (also patents and designs), Luxemburg, Netherlands, Rumania, Russia, Spain, Switzerland.

Copyright.—Austria-Hungary, Belgium,

Chile, Costa Rica, Denmark, France, German Empire, Great Britain, Italy, Japan, Mexico, Netherlands, Norway, Portugal, Spain, Switzerland.

Arbitration.—Austria-Hungary, China, Costa Rica, Denmark, Ecuador, France, Great Britain, Haiti, Italy, Japan, Mexico, Netherlands, Norway, Paraguay, Peru, Portugal, Salvador, Spain, Sweden, Switzerland.

Reciprocity.—Bulgaria, Cuba (commercial), Great Britain, Hawaijan Islands, Mexico.

Naturalization, immigration or emigration. —Baden, Bavaria, Belgium, Brazil, China, Denmark, Ecuador, Great Britain, Haiti, Hesse, Honduras, Mexico, North German Union, Peru, Portugal, Sweden and Norway, Uruguay, Wurttemberg.

The United States has other subjects on which treaties, conventions and agreement are based, besides the foregoing, among which may be mentioned the open door policy and exchange of notes and the final protocol at the conclusion of the Boxer troubles, with China; recognition of the flag, with Congo; interoceanic canal, with Costa Rica; agreement for lease of land for coaling station, with Cuba; readmeasurement of vessels, with Denmark; collection and application of the customs revenues with the Dominican Republic; alliance, act separate and secret, contract for payment of loans, cession of Louisiana and relations in Tunis, with France; general act concerning Samoa, with German Empire; tenure and disposition of property, with Guatemala; abolishing droit d'aubaine, with Hesse, Nassau, Saxony and Wurttemberg; reimbursing shipwreck expenses and exchange of notes declaring policy in the Far East, with Japan; pursuit of Indians (eight agreements) and claims ("The Pious Fund") with Mexico; interoceanic canal, with Nicaragua; right to hold real estate, with Ottoman Empire; neutrals at sea and whaling ships, with Peru; Pacific Ocean and northwest coast of America, neutral rights at sea, cession of Alaska, admeasurement of vessels, fur-seal fisheries and corporations, with Russia; regulation of the liquor traffic, with Sardinia; judicial procedure, discriminating duties, tonnage duties, commerce, with Cuba and Porto Rico, cession of outlying islands and letters rogatory, with Spain; property with Switzerland; neutrals at sea, with the Two Sicilies; and duties on liquors and consular powers, with Zanzibar.

The United States has made more treaties and other forms of agreement with Great Britain than with any other country. These include the following subjects: Naval forces on the Great Lakes; fisheries, boundary, and restitution of slaves; indemnity under the award of the emperor of Russia (1822); indemnity for slaves (1826); arbitration northeastern boundary; boundaries, suppression of slave trade, and extradition (Webster-Ashburton — 1842); boundary west of Rocky Mountains; ship canal connecting Atlantic and Pacific oceans (1850); cession of Horseshoe Reef; reciprocity, fisheries, and navigation; suppression of slave trade (1862, 1863, 1870); claims, fisheries, navigation, and boundary (Treaty of Washington, 1871); original modus vivendi concerning fisheries, 1891, 1906, 1907, 1908, 1909; general act concerning Samoan Islands; fur-seal fisheries; Bering Sea arbitration agreement; deserters from merchant vessels; Alaskan boundary, 1903-05-06; tenure and disposition of property; ship canal (Hay-Pauncefote Treaty, 1901); boundary line between United States and Canada, 1910, and boundary line in Passamaquoddy Bay, 1910.

The Second Hague Peace Conference Conventions (1907) contained the following provisions: Pacific settlement of international disputes; the limitation of the employment of force for the recovery of contract debts; opening of hostilities; the laws and customs of war on land; rights and duties of neutrals in land war; the laying of automatic submarine contact mines; bombardment by naval forces in time of war; the adaptation of the principles of the Geneva Convention to naval war; rights and duties of neutral powers in naval war; and a declaration prohibiting the throwing of projectiles and explosives from balloons. The International Prize Court, which meets at The Hague, when called together to settle some international dispute is composed of 15 judges, eight of whom are chosen by the larger marine countries, Germany, Austria-Hungary, France, Great Britain, Italy, Japan and the United States, the other judges being chosen from the remaining nations. In prize cases an appeal may be taken from national courts to the international court, according to the Convention of 21 Sept. 1910.

The conventions concluded at the Central American Peace Conference in 1907 contained provisions respecting peace and amity; the establishment of a Central American Court of Justice; extradition; the establishment of an international Central American bureau and a pedagogical institute; and regarding communications.

The following are the treaty negotiations of 1911: 24 February, new treaty with Japan was ratified by the United States; and on 4 April ratifications were exchanged at Tokio. The significant feature of this treaty is its omission of any explicit stipulation concerning the regulation of the emigration of the people of one country to the other. As part of this treaty, which is one of commerce and navigation, the representatives of the two countries agreed upon the proctocol of a provisional tariff arrangement and a declaration on the subject of immigration made by the Japanese government. Japan further agreed to continue to grant to the United States the "most favored nation" treatment in tariff matters, pending the negotiation of a special agreement.

On 17 May 1911 the draft of a general treaty of arbitration was submitted by Secretary Knox to the British and French Ambassadors; and on 28 June it was announced at Washington that this treaty had been agreed upon in every important provision. It is the first comprehensive agreement for arbitrating practically all disputes that can arise between two sovereign nations, including even questions of vital interest and national honor. It provides for arbitration by The Hague court of all questions, without reservation, that are regarded by the contracting parties as proper for arbitration. All other disputes are to be submitted to a commission of inquiry, to be composed of the permanent court of The

Hague. This commission will investigate and report whether or not the matters in controversy should be arbitrated. This treaty was signed 3 Aug. 1911 between the United States, Great Britain and France and was finally ratified 7 March 1912.

On 28 June a treaty abolishing pelagic sealing was signed at Washington by representatives of the United States, Great Britain, Russia and Japan.

On 26 January the reciprocity agreement between the United States and Canada was submitted to the legislative bodies of both countries. It was upheld in Congress, but in the Canadian elections on 22 September the party supporting the proposed trade reciprocity was defeated.

The most important event in which the treaty-making power of the United States was involved at the end of 1911 was President Taft's abrogation of the Russian Treaty of 1832 with this country. This was done 17 December by his directing the American Ambassador at Saint Petersburg to denounce the treaty in friendly terms. The notification that he had so acted was delivered to the Foreign Office 18 December. The action was taken by the President on the primary ground that Russia had violated the terms of the treaty by refusing to visé passports for American citizens of Jewish birth or Catholic faith. The House had voted 300 to 1 demanding abrogation. The operation of the treaty — which was one of commerce and navigation — ceased by this action on 1 Jan. 1913.

Under an agreement entered into between the United States and Great Britain 20 July 1912 all outstanding claims between the two countries shall be submitted to arbitration. The arbitration treaty with France which expired in 1913 was renewed in February of the same year. In 1914 the so-called Bryan-Wilson treaties were presented by the United States to various foreign countries. The object of these treaties was to provide a means of preventing international trouble from developing into war. In general these treaties stipulate that the contracting parties to the treaty shall, in each case, submit to a commission all international disputes that cannot be settled by diplomacy. The contracting parties to each treaty bind themselves not to declare war or begin hostilities until such time as the commission shall have submitted its findings. Each nation is free to disregard the report of the commission if it should see fit to do so. The following countries entered into the Bryan-Wilson treaty agreement with the United States: Salvador, Guatemala, Panama, Honduras, Nicaragua and The Netherlands in 1913; Bolivia, Persia, Portugal, Costa Rica, Switzerland, Dominican Republic, Venezuela, Denmark, Italy, Norway, Peru, Uruguay, Argentina, Brazil, Chile, Paraguay, China, France, Great Britain, Spain, Russia, Ecuador, Greece, Sweden, in 1914; and Norway in 1915. For the Peace Treaty of the World War, signed 28 June 1919, see WAR, EUROPEAN — TREATY OF VERSAILLES. See also INTERNATIONAL CLAIMS AND DISPUTES; HAGUE COURT, THE; INTERNATIONAL LAW.

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TREATING. See CORRUPT PRACTICES ACTS.

TREATY, an agreement, league or contract between two or more nations formally signed by commissioners properly authorized, and ratified by the supreme power of each state. Treaties are not admissible by subordinate States, for instance, New York State cannot make any binding treaty with Canada, as that is the province of the Federal government at Washington. The conditions that govern or should govern treaties are defined in INTERNATIONAL LAW (q.v.). The treaty-making power of the United States is vested in the President, though the work of treaty-making falls to the office of the Secretary of State. It is usual for the President to seek the advice of the Senate in making a treaty, in order that it may receive their prompt ratification. The Senate has the right to return a treaty for amendment or reject it. When the Senate ratifies, the President, through the Secretary of State, may sign and conclude the treaty. A treaty so made overrides all State laws, even their constitutions, but it cannot deprive individuals of their constitutional rights. Where a treaty involves a payment of money the House of Representatives, where all appropriation bills must originate, has claimed a right to participate; but this claim remains disputed. In France the President makes treaties. In countries where there is a sovereign it is usually his privilege, though he may be held in check by legislative power. Treaties of alliance are common, as the well-known alliance between Great Britain and Japan made in 1902 and extended in 1905, which resulted in bringing Japan into the World War. Treaties regarding boundaries and distribution of territory are also common; submission of differences to arbitration; trade agreements; navigation and fishing regulations; exchange of moneys, mail, etc.; protection of copyrights; return of criminals; adoption of rules of international law; adoption of recommendations of The Hague Peace Tribunal.

Some famous treaties are Westphalia Treaty, closing the Thirty Years' War, in 1648, in which most of the nations of Continental Europe participated; Peace of Utrecht, a series of treaties between 1713 and 1715, between France, as opposed to England, Holland, Prussia, Savoy and Portugal; treaty of independence of the United States, accepted by Great Britain at Paris in 1783; the parti-

tion of Poland in 1772 and again in 1793; the separation of Belgium and The Netherlands, made at London 1831 and modified 1839; cession of part of Lombardy to Sardinia in 1859; dissolving the German Confederation and establishing of the North German Confederation with full recognition by Austria, the transfer of Schleswig-Holstein to the new confederation and ceding the balance of Lombardy to Italy in 1866; Treaty of Frankfort, being new treaty of France and the German Empire after the War of 1871; settlement of territory growing out of Spanish-American War, between United States and Spain, 1899; Russo-Japanese treaty of peace at Portsmouth, United States of America, 1905; the German Peace treaty signed at Versailles, 1919. Various agreements tending to mitigate the horrors of war have been incorporated in treaties on numerous occasions. Guarantees for the performance of conditions in treaties are usually demanded and formerly it was customary to give hostages. International law has been framed as the recorded customs governing civilized nations in carrying out their treaties. Refusal to abide by a treaty is a cause of war, since treaties bind both parties until mutually abrogated. It is generally conceded that a war wipes out all previous treaties between the parties and that they have to be made again to come into force. If a state change its government, as in going from a monarchy to a republic, all treaties are void and have to be remade with the new government to be effective. Consult 'Treaties, Conventions, Etc., Between the United States of America and Other Powers, 1776–1909' (Washington 1910); Herslet's 'British and Foreign State Papers' (London); Albin, P., 'Les Grandes Traités Politiques' (Paris 1911); Crandall, S. B., 'Treaties: Their Making and Enforcement' (Washington 1915). See HAGUE COURT, THE; TRIPLE ALLIANCE; TREATIES; TREATIES OF THE UNITED STATES WITH FOREIGN NATIONS; WAR, EUROPEAN — TREATY OF VERSAILLES.

TREATY, Anglo-Japanese. See ANGLO-JAPANESE TREATIES.

TREATY ELM, a celebrated tree, formerly in the environs of Philadelphia, Pa., under which William Penn (q.v.) negotiated a treaty with the Indians. A monument marks its place.

TREATY PORT, a port open to commerce with certain nations in accordance with the terms of a treaty, in a country not generally open to foreign commerce. China is the one nation where treaty ports were for many years of importance; the first ports were opened to trade by the Nankin treaty with Great Britain in 1842; these ports were Canton, Amoy, Fu-Chau, Ningpo and Shanghai. Since then other treaty ports have been established, by the treaty with Japan in 1895 and by the treaty with the powers in 1902. About 1900 they numbered over 30, and include Samshui, Wuchow, Whuhu, Shasi, Chung-King, Yochow Hangchow, Su-Chau, Lungchow, Niu-Chwang (the most northern), Chang-Sha, Ngan-King, Wan-Hsien, Wai-Chau and Kong-Mun. Since 1912 the Republic of China has made all her ports free. Japan was also first opened to foreign commerce by means of treaty ports; the first treaty in March 1854 with the United States opened two ports, Simoda and Hakodadi, to American commerce; in the same year the British gained access to two ports, and later the Dutch and the Russians; by subsequent treaties both the United States and Great Britain gained more ports and further privileges. In 1899 Japan was recognized as on an equality with the other powers, and the whole country thrown open to foreign trade.

TREATY OF PORTSMOUTH. See PORTSMOUTH, TREATY OF.

TREATY OF SAN STEFANO. See SAN STEPHANO, TREATY OF.

TREBBIA, trĕb'bē-ä, Italy, a tributary of the Po which rises in the mountains of Liguria. It was on the banks of the Trebbia that the Romans under Sempronius were defeated, 218 B.C., by the Carthaginians under Hannibal.

TREBIZOND, trĕb'ĭ-zŏnd, Asia Minor, (1) A seaport, military station and capital of a vilayet of the same name, in the northwestern extremity, on the Muchka where it enters the Black Sea, 120 miles northwest of Erzerum. It has a citadel, mosques and churches; its streets are irregular and narrow. It is the see of an Armenian archbishop, a United Armenian bishop and a Greek metropolitan. Its trade is important. The exports consist of tobacco, carpets, silks, fabrics, cattle, raisins, walnuts and hazelnuts. The imports are cotton and woolen manufactures, sugar and silks. It was founded by the Greeks about 700 B.C. On the establishment of the empire of Trebizond by Prince Alexius, in 1204, this city was made the capital. The Turks overran the region and took the city in 1641. It was captured by Russia in 1916, but owing to the disruption of the Russian forces it was not long held. Among the Greek major and minor claims at the Peace Conference in Paris 1919 was the proposal to form the Pontian Republic of the region around Trebizond, with the ancient city as the capital. Trebizond is the residence of foreign consuls. Pop. 55,000. (2) The vilayet or province has an area of 16,671 square miles. It has great mineral riches and extensive forests, and a mixed population. Pop. 1,265,000.

TREBLE, Lillian Massey, Canadian philanthropist: b. at New Castle, Ontario, 2 March 1854; d. California, 1909. She became interested in mission work and organized classes in domestic science which led to her founding The Lillian Massey School of Household Science and Art. Similar results were secured at Toronto and other universities and she gave the Toronto University a handsome building which was opened in 1913.

TREBUCHET. See ORDNANCE.

TREE, Sir Herbert Beerbohm, English actor: b. London, 17 Dec. 1853; d. 2 July 1917. He was a son of Julius Beerbohm, and was educated in England and Germany. After entering upon a business career he became interested in private theatricals, and adopted the profession of the stage in 1878. Succeeding in this, he assumed the management of the Haymarket Theatre in 1887, and became one of the most conspicuous of the actor-managers of recent times. After 1897 he played in his own theatre, Her Majesty's, one of the best constructed of

London playhouses. He possessed great versatility, and played parts ranging from Hamlet to Falstaff. Tree achieved an early success in 'The Private Secretary' (1884). This was followed by Macari in 'Called Back,' and by the part of the Russian Spy in 'The Red Lamp' (1887). In eccentric character parts he essayed the leading rôles in 'The Ballad-Monger' and in 'Trilby.' In modern social drama he appeared in 'A Bunch of Violets,' 'Captain Swift,' 'A Woman of No Importance,' 'John-a-Dreams,' 'The Dancing Girl' and 'The Tempter'; while of Shakespearean plays he produced 'Merry Wives of Windsor,' 'Hamlet,' 'Henry IV' and 'The Taming of the Shrew.' Stephen Phillips' 'Herod' was written for him. His publications include 'The Imaginative Faculty,' delivered as a lecture before the Royal Institution (1893); and other lectures on 'Hamlet from an Actor's Prompt Book'; 'Henry VIII and His Court'; 'Thoughts and Afterthoughts' (1913); 'Nothing Matters' (1916), etc. He received the honor of knighthood in 1909.

TREE-CAT, a palm-civet. See PALM CAT.

TREE-CREEPER, a bird (*Certhea*). See CREEPER.

TREE-CRICKET, one of the small, almost colorless crickets of the genus *Œcanthus*, specifically the snowy cricket (*Œ. niveus*), whose two-syllabled rhythmic night-song is one of the most familiar summer noises of eastern America. This song varies greatly in pitch and rapidity according to the temperature and other conditions. In the day-time the insect trills in a different voice. Consult Howard, 'The Insect Book' (New York 1901), wherein will be found extensive references to other works.

TREE FERNS. See FERNS AND FERN ALLIES.

TREE-FROG, or **TREE-TOAD,** a frog of the family *Hylidæ*, distinguished from common frogs (*Ranidæ*) by having the ends of the fingers and toes dilated into flattened discs or suckers, which enable them to lead their peculiar arboreal life. They are of more elegant form, smaller size, brighter colors and more active habits than the *Ranidæ*, and are lively during the day; they feed on insects, which they pursue on bushes and trees, stealing toward them or suddenly springing and swinging upon them; they climb like geckos, and by the same mechanism; the lower surface of the discs is endued with a viscid secretion, by means of which they can walk with the body suspended from the under parts of leaves and other smooth bodies; the skin is mostly smooth upon the back, but on the abdomen and inside of legs thickly studded with small warts or tubercles. They possess to a remarkable degree the faculty of changing color, by the modifications of the contents of the pigment cells under the skin (see CHROMATOPHORES), no doubt a provision to enable them to elude their numerous enemies. They are very clamorous, and particularly noisy at the approach of rain. In winter they bury themselves in the earth or in the decayed wood and dust of old stumps. They breed in the spring, depositing their eggs in the water. The species are numerous, especially in tropical America.

The common tree-frog of North America (*Hyla versicolor*) resembles a toad in form, but is more flattened; body short and warty above, the color varying from pale ash to dark brown, with several large irregular blotches of greenish brown, white and granulated below, and abdomen yellowish near the thighs; the colors vary at the will of the animal. The head is short and rounded, the mouth large, with teeth on upper jaw and vomer; eyes large and brilliant, the iris bright golden; there are four fingers and five toes, both ending in viscous pellets, the former distinct, but the latter webbed. It is about two inches long, and is found abundantly as far west as the Mississippi, on decaying trees and about old fences of wood or stone, the color of which it nearly resembles. It is very noisy in spring and summer toward evening, especially in cloudy weather, and its cheerful and abruptly terminating note must be familiar to all residents in the country. This species in the Southern States is replaced by the green tree-frog, which is bright green above, yellowish white below, with a straw-colored lateral line extending from the upper jaw over the shoulder and along the side; it is shorter and more slender than the northern species, and is most commonly seen about broad-leaved plants, especially Indian corn, the color of the leaves of which it greatly resembles, concealed during the heat of the day, but coming out morning and evening and becoming very active and noisy; the single note is clear and bell-like. The tree-frog of Europe (*H. arborea*) much resembles this. Several other species occur in the Southern and Southwestern States. In the genus *Acris* the locomotive discs are less developed and the limbs more slender than in *Hyla*, and there are teeth on the palate instead of the vomer. The *A. gryllus*, or cricket, is about one and one-half inches long, with an elongated pointed head, a triangular dusky spot between the orbits; body ashy above, with a green and sometimes reddish dorsal line, and three oblong black spots margined with white on the sides. It is a lively species, constantly chirping like a cricket, even in captivity. In the genus *Hylodes* the palate is toothed, and the slender fingers and toes are free, with small discs. Pickering's tree-frog (*H. pickeringii*) is nearly an inch long, with short head and yellowish brown body, with dusky rhombodial spots and lines, sometimes like the letter X on the back; pale flesh-colored below, tinged with yellowish on the throat. This is the true peeping frog, the noise being made by both sexes; in summer they cease to be vocal, retiring from the pools where the eggs were laid to the woods, where they live on trees, hopping about on the branches in search of insects and occasionally uttering a shrill whistle.

Many strange variations in breeding-habits and rearing of young characterize the tree-frogs of tropical America, which exist in a great number of genera and species. A famous South American species is the ferreiro (*H. faber*), which makes small pens or nurseries under water in which its eggs are left to hatch, and where the tadpoles are confined, protected from many dangers. Another species (*H. goeldii*) carries its few large eggs on its back until they hatch, and the young remain some time afterward. The genus *Nototrema* develops pouches in the skin of the back of the female in which the eggs and young are safely transported. Ex-

tensive information and guidance to further facts may be found in the 'Cambridge Natural History' (Vol. VIII, London 1901).

TREE-KANGAROO. See DENDROLAGUS; KANGAROO.

TREE-PORCUPINE, or **COUIY,** a South American arboreal porcupine (q.v.) of the genus *Cercolabes* (or *Sphingurus*), characterized prominently by the long, naked prehensile tail. There are several species, all small and short-spined.

TREE-RAT, a small East Indian rat (*Mus arboreus*), common in Bengal. It builds a nest in cocoanut trees and bamboos, and lives partly on grain and partly on young cocoanut.

TREE-SHREW, or **BANXRING,** a small squirrel-like insectivore of India and the Malay Archipelago, the several species of which constitute the family *Tupaiidæ*. The fur is soft and glistening, and a long, bushy tail is generally present. They are restlessly active during the day, searching for insects and fruits, both on the ground and in trees. Two of the largest species are the tana (*T. tana*), with a feathery tail, in one variety of a bright, golden color; and the ferruginous banxring (*T. ferruginea*), widely distributed in the Malayan region. The soles of the feet in the latter are plaited like those of geckos and give the animals a sure grip of a branch. Consult Blanford, 'Mammals of India' (London 1888).

TREE-SPARROW. See SPARROW.

TREE-TOAD. See TREE-FROG.

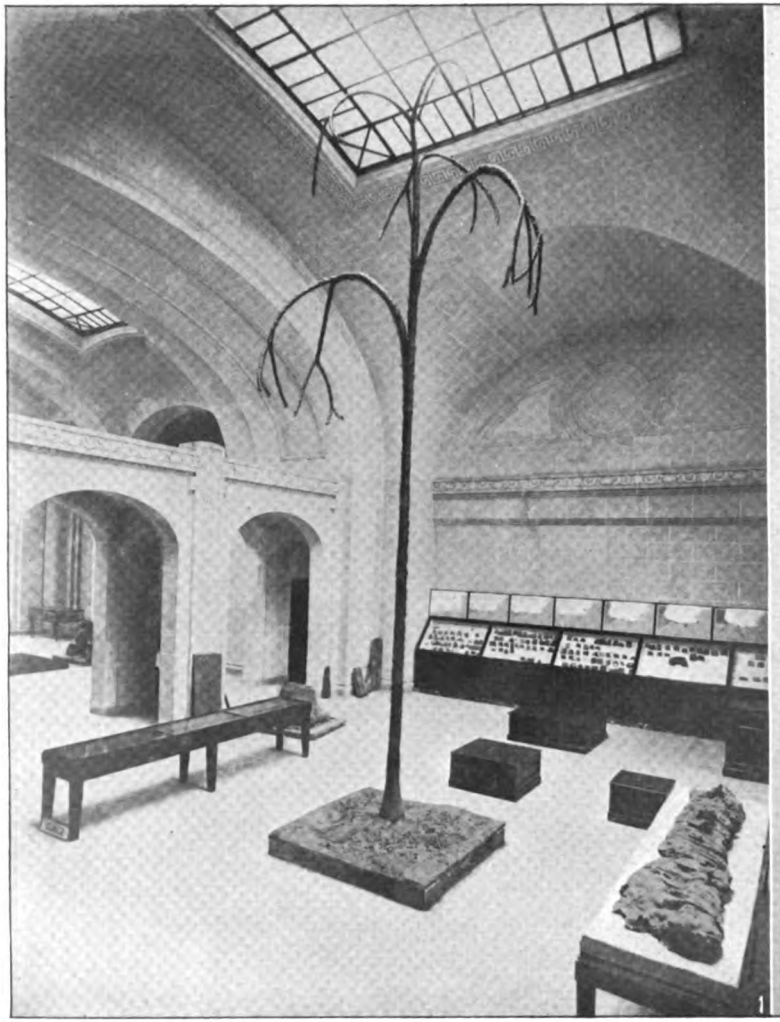
TREE OF TULE. Among the big trees of the world, the best known are the Sequoias, or Giant Redwoods of California, which reach a diameter of 36 feet and a height of 279 feet. Not so widely known, but equally tall, are the Eucalyptus trees of southeastern Australia. The Banyan trees of India cover more space, but these are more like a grove than a single tree. The Big Tree of Tule may fairly claim to be the largest tree in the world. Tule is about 360 miles south of the City of Mexico and just a few miles south of Oaxaca, on the stage road between Oaxaca and the Ruins of Mitla. The tree is about 50 feet in diameter — Campbell's guide book gives the circumference as 154 feet and two inches at six feet from the ground — and the height is a little more than three times the diameter of the trunk, so that in general appearance it resembles a gigantic willow. A common name for the tree is The Montezuma Cypress. The scientific name is *Taxodium mucronatum;* consequently, it is closely related to the Swamp Cypress, or Bald Cypress (*Taxodium distichum*) of the southern United States. The Montezuma Cypress was once abundant in Mexico and many of the trees were very large, but, even in the time of Cortez, the Big Tree of Tule was famous as the largest of all living things. Humboldt carved on the trunk an inscription which is now so overgrown that only the beginning and end of the lines can be read. The government — at least until 1912 — recognized the tree as a wonder and kept guards to preserve it against the ravages of tourists. Estimating the age by the annual growth rings and assuming that the growth rings of the big tree are of about the same width as in other large trees of the same species, the Big Tree of Tule must be at least 5,000 years old. The famous Tree of the Sorrowful Night — Arbol del Noche Triste — in the City of Mexico, the tree under which Cortez rested after his worst defeat at the hands of the Aztecs, belongs to the same species.

TREE WORSHIP. The worship of a tree as in itself divine does not appear to have prevailed in any age of the world. In the mythology of ancient Greece and Rome, trees were regarded as the abodes of sylvan deities, supernatural beings, inferior to the gods of Olympus. Even where this view was not taken, and the tree was not venerated as the dwelling-place of divinity, trees were associated with the worship of the gods, and a certain degree of sanctity attached to them. This association was so strong and to the popular view so indissoluble, that to destroy a grove in which a god was worshipped was to put an end to the worship at that particular spot. Bible statements (1 Kings xv, 13, 14 and other places) show that the removal of an idol, while the grove remained, was not sufficient to put a stop to idolatry. The sacred groves were also an essential feature of Druidical worship. It should be remembered that, while the philosophers and other learned men of ancient Greece and Rome looked upon the current mythology with incredulity, if not contempt, the great mass of the people, and in particular the peasantry, were deeply devoted to it, and to them the sacred groves, the dryads, fauns and satyrs were very real.

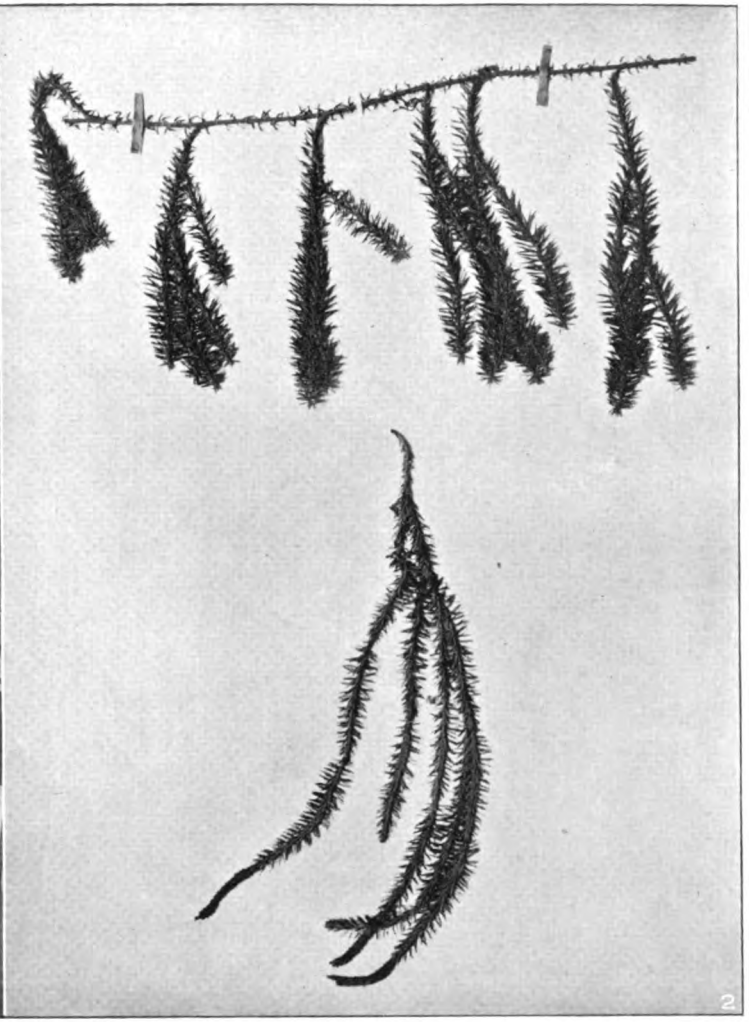
Tree worship, or anything resembling it, has no place in any branch of Christianity, and among Christians the attachment to trees, or any particular tree, is entirely a matter of natural sentiment. There is nothing of the kind in Mohammedanism, and the sacred literature of Buddhism attaches no sanctity to trees. Nevertheless, before the destruction, in October 1887, of the Bo tree, grown from a branch of the tree sent by Asoka, king of Maghada, and famous as a devotee of Buddhism, to Ceylon, in the 3d century B.C., thousands of pilgrims visited the tree annually and offered up prayers before it. This cannot be called tree-worship in the ancient meaning of the term. It is true, nevertheless, that the early Buddhists regarded certain trees as sacred, and much time elapsed before members of that faith got rid of their old superstitions in this respect. Those superstitions still prevail among the more barbarous races, and some of the Greek Christians in remote districts are said to mingle pagan worship of tree-gods with their nominally Christian practices.

TREFOIL, any of several plants having trifoliate leaves, as clover, etc., especially bird's-foot (q.v.), a legume of the genus *Lotus* (q.v.). *In architecture,* a three-lobed ornament, forming a conventionalized figure of three leaves, used in tracery, panels, windows, etc. Also *in heraldry,* a bearing or charge representing a conventional triple clover-leaf, always accompanied with its slip or stalk. It signifies fidelity.

TREGEAR, Edward, Australian author: b. London, 1 May 1846. He went to New Zealand in 1863, where he served in the Maori War and other military work. Later he became gold fields surveyor at Coromandel and



1 The oldest tree in the world. A giant Club-moss (Lepidodendron) flourished in Devonian times (q. v.). Restored, natural size, from only known fossil, found in New York State, and now in New York State Museum



2 Specimens of Club-moss (Lycopodium q. v.) the present living representative of the Devonian giant

Thomas, and surveyor of native lands. He organized the Labor Department of the New Zealand government in 1891; and he was decorated by the French government in 1896. Among his published works are 'The Maori Polynesian Comparative Dictionary'; 'Fairy Tales of New Zealand and the South Seas'; 'The Maori Race'; 'A Dictionary of the Mangareva'; 'A Dictionary of Niue.'

TREGELLES, trĕ-gĕl'ĕs, **Samuel Prideaux,** English Biblical scholar: b. Falmouth, 30 Jan. 1813; d. Plymouth, 24 April 1875. Early in life he worked in the iron foundries at Glamorgan, and by himself studied the classical and Oriental languages. In 1837 he settled in London, where he superintended the publication of the 'Englishman's Greek Concordance to the New Testament' (1839) and the 'Hebrew and Chaldee Concordance to the Old Testament' (1843). In 1838 he began the critical study of the New Testament, and formed the design of a new Greek text derived from a comparative study of ancient manuscript. With this end in view he made several visits to the Continent, spending five months in Rome, where he discovered some important readings in his examination of Codex B in the Vatican, which manuscript, however, he was not allowed to copy. He published his 'Account of the Printed Text of the Greek New Testament' in 1854, and in 1857 began the publication of the first part of the Greek Testament, comprising Matthew and Mark. The remainder of the gospels and the epistles were published from time to time until 1870. The 'Revelation' was edited from his notes by S. J. Bloxidge and B. W. Newton in 1872, and in 1879 Dr. Hart published his materials for the prolegomena in an appendix to the Greek Testament. Others of his works are 'Defense of the Authenticity of the Book of Daniel' (1852); 'Collation of the Texts of Griesbach, Scholz, Lachmann and Tischendorf, with that in common Use' (1854); and the 'Codex Lacynthius, Fragments of Saint Luke' (1861).

TREITSCHKE, Heinrich von, German historian: b. Dresden, 15 Sept. 1834; d. Berlin, 28 April 1896. He was educated at the universities of Bonn and Leipzig and early advocated a German union in his writings. In 1858 he was appointed lecturer in history at the University of Leipzig and became the most popular teacher at that institution. He also became known to the general public through a series of lectures on the constitutional history of Germany. He was a close student of the political trend in Germany and in 1864 he advocated a German union under Prussian leadership. About 1865 he was appointed to a lectureship at Freiburg, but he resigned the following year to become editor of the *Preussische Jahrbücher.* His strong and sometimes violent opposition to modern liberal tendencies in government led to frequent bickerings with Brentano, Schmoller and other economists and led to his resignation. He was next at the University of Kiel, at Heidelberg in 1867–73, and after 1873 held a chair at the University of Berlin. After the formation of the empire in 1871 Treitschke was elected to the Reichstag. At first a National Liberal he became ever more and more conservative. His uncompromising Germanism caused him to make violent attacks on all opinions and all party groups in which he saw something injurious to the rise of the German Empire. He was now one of those who sang the praises of the Hohenzollerns and in the days of the Kulturkampf he ably supported the government. Treitschke attacked the Ultramontanes, the Socialists and the Jews. In Great Britain he saw the chief obstacle to German imperialism and colonial expansion. He was responsible for most of the anti-British feeling in Germany in the last decade of his life. In England he remained comparatively unknown, until the outbreak of the war in 1914 caused renewed discussion of Germany's political thought in the closing quarter of the 19th century. His writings were now translated and extensively circulated. Treitschke was attacked as one of the instigators of the war; his anti-English utterances were quoted in proof of the allegation that he foresaw an unavoidable conflict between the two countries.

As a historian Treitschke is highly regarded. His especial claim to fame is his 'Deutsche Geschichte im neunzehnten Jahrhundert' (5 vols., 1874–94; English translation, 7 vols., New York 1915 et seq.). This work was incomplete at the author's death, ending with a discussion of the events preceding the Revolution of 1848. This history is one of the classics of Germany because of its power of style, skilful character delineation and vigorous narration. Its faults are discursiveness, bad arrangement and extreme partisanship. Other works are 'Zehn Jahre deutscher Kämpfe, Schriften zur Tagespolitik' (1874; 3d ed., 1897); 'Der Sozialismus und seine Gönner' (1875); 'Der Sozialismus und der Meuchelmord' (1878); 'Ein Wort über unser Judentum' (1880); 'Historische und politische Aufsätze' (1865; 1870; 1897); 'Zwei Kaiser' (1888); 'Politik,' collected lectures on political subjects (2 vols., 1907); 'Ausgewählte Schriften' (2 vols., 1907). Selections from the 'Politik' have appeared in English (London 1914). There is in English a collection of Treitschke's essays between 1871 and 1895, entitled 'Germany, France, Russia and Islam' (London 1915). Consult Davis, H. W. C., 'The Political Thought of Heinrich von Treitschke' (1915); Schiemann, T., 'Heinrich von Treitschkes Lehr. und Wanderjahre' (2d ed., Munich 1898); Hausrath, A., 'Zur Erinnerung an Heinrich von Treitschke' (Leipzig 1901); id., 'Treitschke, His Doctrine and His Life' (New York 1914); McCabe, Joseph, 'Treitschke and the Great War' (New York 1914); McClure, E., 'Germany's War Inspirers' (New York 1915); Mügge, M. A., 'Heinrich von Treitschke' (New York 1915).

TRELEASE, William, American botanist: b. Mount Vernon, N. Y., 22 Feb. 1857. He was graduated at Cornell University in 1880 and took his degree as Sc.D. at Harvard in 1884. He was in charge of the Summer School of Botany in the later institution (1883–84); was lecturer on botany in Johns Hopkins (1884); director of the Missouri Botanical Garden (1889–1912), and since 1913 has been professor of botany in the University of Illinois. He is a member of various learned societies, the editor of several botanical works and author of numerous reports on botanical and entomological subjects.

TRELLIS, a frame composed of crossed bars or latticed and used for many purposes.

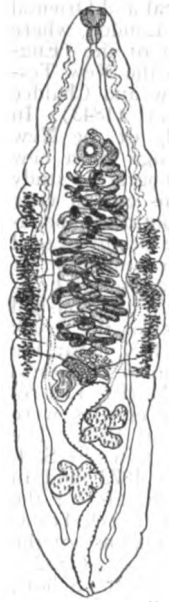
The French espalier is a kind of trellis made of larch wood about shoulder-high on which shrubs, flowers, vines, roses, etc., are trained and supported.

TRELLISED DRAINAGE, also known as LATTICED DRAINAGE, is a drainage network in which there is a notable tendency for the larger streams to occupy parallel courses, with the tributaries notably at right angles or nearly so. This may be caused by parallel series of faults or joints which control the courses of the streams. More often, however, it occurs in regions like the Appalachians, where the rocks consist of alternating hard and soft beds tilted up on edge. The streams may at first occupy any position, but those on the softer rocks develop more rapidly than the others and finally capture their less favored neighbors until all the larger rivers occupy parallel courses on the soft beds. At a few points the large streams break across the hard rock ridges and at these points the valleys become notably narrower, forming narrows or water gaps. When as a result of piracy such water gaps loose their streams they are called wind gaps. Contrasted with trellised drainage is the branching, tree-like pattern developed on flat-lying beds or on homogeneous rocks and known as dendritic drainage. See STREAM PIRACY; and the section on *Work of Running Water* in the article on GEOLOGY.

TREMAIN, Henry Edwin, American soldier: b. New York, 14 Nov. 1841. He was graduated from the College of the City of New York in 1860, served in the Union army 1861–66, rising from the grade of private to brigadier-general of volunteers, and for conduct at the battle of Resaca, Ga., 15 May 1864, he was awarded a Congressional medal of honor. After the war he pursued the study of law and was graduated from the Columbia Law School in 1867. He was United States attorney of New York in 1873–77, and has since engaged in law practice. He is active in political matters, prominent in various military organizations of the veterans of the Civil War and has published 'Sailor's Creek to Appomattox Court House, or the Last Hours of Sheridan's Cavalry' (1885).

TREMATODA, or FLUKES, a prominent class of the branch or phylum Plathelminthes of consistently parasitic habit. The simple body, the presence of an alimentary canal and even of some special sense organs together with the occurrence in most cases of free living stages in development shows that the trematodes stand much nearer free living forms like the Turbellaria than do the cestodes. Furthermore, while the majority of flukes are endoparasitic there are also ectoparasitic species which display considerable freedom and not only pass from host to host but have an extended period of free existence before they assume the parasitic life.

Trematoda are generally flattened and elongate though some are conical, cylindrical or irregular in form. The mouth is mostly at or near the anterior tip of the body and the excretory pore near the posterior end. Highly developed muscular suckers are found at the anterior end on the ventral surface or at the posterior end. The ectoparasitic species have commonly chitinous hooks or anchors in connection with the suckers to serve as additional organs of attachment. Many species are more or less covered with minute scales or spines. Trematodes vary in size from 0.2 mm. to 25 or rarely 75 mm. in length. The body is solid as parenchymatous tissue fills all the space between the organs. The alimentary system is either rodlike (rhabdocoel) or shaped like a tuning fork (triclad). In some of the larger forms it possesses lateral branches which may assume a complex aspect. There is no skeletal system but muscular layers of circular, longitudinal and diagonal fibres lying near the surface of the body form the main part of the dermomuscular sac. By virtue of this excessive muscular development the flukes are extremely mobile and variable in form. Stellate flame cells terminating in minute tubules constitute the elements of the excretory system which varies in complexity with the size of the organism.



Opisthorchis felineus, from liver of man. Europe. (Original drawing from type specimen.)

The reproductive system comprises with rare exceptions the organs of both sexes. The male organs are rather simple, whereas the female system is very complex. The parts and their relations are very similar to those found in cestodes. The development of trematodes is direct and simple among the ectoparasitic forms but complex among endoparasites where it is complicated by alternation of generations and one or more changes of host. In the common sheep liver fluke which presents a life cycle of moderate complexity, a minute ciliated embryo escapes from the egg shell whenever this is carried by chance into a water body. The little free swimming larva (miracidium) seeks out a snail and in its liver tissue metamorphoses into a sac (sporocyst) in which is developed a new generation (redia). Within these individuals are produced similar forms or when conditions are favorable a modified type (cercaria) which deserts the snail and encysts on grass or in the water. This form is really the young distome and it attains the stomach of the sheep with food or drink. There set free by digestion, it wanders into the liver and by growth becomes adult. Even more complex conditions are found in other species; the most if not all endoparasitic trematodes agree in selecting a mollusk as an intermediate host and in manifesting alternation of generations.

Several species are of great economic importance; thus the sheep liver fluke (*Fasciola hepatica*) produces epidemics of liver rot of great magnitude, entailing large annual losses to sheep raisers in England, Australia and on the Continent; the loss in extreme instances has reached $20,000,000 in a single year.

About a dozen species of fluke are known as human parasites. The Asiatic lung fluke (*Paragonimus westermani*) is very abundant in

the East (Japan, China, Formosa and the Philippines) and produces a disease resembling tuberculosis. A related species has been reported from a few localities in the United States. The Chinese intestinal fluke (*Fasciolopsis buski*) though formerly believed to be rare, is now known to be exceedingly abundant in some parts of China, Siam, etc. It gives rise to serious intestinal troubles.

The human liver fluke (*Clonorchis sinensis*) is very abundant in some parts of China and Japan and has frequently been introduced into this country. The human blood fluke has three species; *Schistosoma hæmatobium* which has been identified in Egyptian mummies of the 20th dynasty (1250 B.C.) and is exceedingly common in that and adjacent regions to-day. *Sch. japonicum*, endemic in parts of Japan, China and the Philippines; *Sch. mansoni*, reported first from the West Indies, and known to occur in Central and South America and in the Kongo Basin, Africa. It was very likely introduced into this continent by the slave trade. All species are the cause of serious circulatory, renal and intestinal disturbances. The eggs are evacuated either with urine or feces and are distinguished in that the Egyptian form possesses a terminal spine, the Japanese form is spineless and the form from the West Indies has a lateral spine on the egg. The disease produced by the first species has long been known as Egyptian hæmaturia. For further data consult Fautham, Stephens and Theobald, 'Animal Parasites of Man' (London 1916); Ward, H. B., 'Trematoda in Reference Handbook of Medical Sciences' (New York 1917).

HENRY B. WARD,
Professor of Zoology, University of Illinois.

TREMOLITE, a white or gray variety of amphibole. It occurs abundantly either in distinct crystals or in columnar or fibrous masses. It is essentially a calcium and magnesium metasilicate, being distinguished from the other varieties of the mineral by its pale color due to the absence of iron.

TREMULANT, a draw-stop in a pipe or reed organ which regulates a mechanical device consisting of a thin metallic plate so arranged as to modify the admission of wind into the pipes, and by its vibrations produce a sweetly tremulous or waving effect, presumably imitative of the *vox humana*, or human voice. Young organists usually have to be warned against the overuse of this device.

TRENCH, Herbert, British writer of poems and plays: b. Avoncore, County Cork, Ireland, November 1865. He was educated at Oxford and was a Fellow of All Soul's College; became examiner at the Board of Education (1891); then traveled extensively abroad and was director of the Haymarket Theatre where he produced Shakespeare's 'King Lear' and Maeterlinck's 'The Blue Bird.' He was founder of the British Institute in Florence, where he drew up the scheme for producing a better understanding between Great Britain and Italy (1918). He published 'Deirdre Wedded and Other Poems' (1901); 'Lyrics and Narrative Poems' (1911); 'Napoleon,' a play (1918), etc.

TRENCH, Richard Chenevix, Irish prelate, archbishop of Dublin; b. Dublin, 9 Sept. 1807; d. London, 28 March 1886. He was educated at Harrow and Trinity College, Cambridge, where he was graduated in 1829. His college friends included Tennyson, Hallam, Maurice, Sterling and Kemble. Ordained in 1832, he became curate at Hadleigh, in Suffolk, in the following year. He took priest's orders in 1835, and held the curacy of Curdridge, Hampshire, during 1835–41. After a few years as curate at Alverstoke, in Hants, he obtained the rectory of Itchenstoke, in 1844. He became examining chaplain to Bishop Wilberforce of Oxford in 1845, and professor of divinity in King's College, London, the next year. The latter post was held by him till 1858, and during 1856–63 he was dean of Westminster. He was consecrated archbishop of Dublin on the first day of 1864. He resisted the disestablishment proposals of Gladstone, but accepted the new conditions loyally. He resigned the see in 1884. He was buried in Westminster Abbey. Trench was known as a poet by many sonnets, lyrics and other verses published in the following, among other volumes: 'The Story of Justin Martyr, and other Poems' (1835); 'Poems from Eastern Sources' (1842). His contributions to philological subjects include 'The Study of Words' (1851); 'English, Past and Present' (1855); and 'A Select Glossary of English Words' (1859). His Biblical and theological works comprise 'Notes on the Parables of our Lord' (1841); 'Exposition of the Sermon on the Mount' (1844); 'Christ the Desire of all Nations' (1846); 'Studies in the Gospels' (1867), and many volumes of sermons. He was a member of the committee for revising the New Testament. Among his other publications are 'Sacred Latin Poetry' (1849); 'A Household Book of English Poetry' (1868); 'Plutarch: his Life, his Lives, and his Morals' (1873); and 'Lectures on Mediæval Church History' (1877). Consult 'Letters and Memorials of Richard Chenevix Trench' (1888).

TRENCH, Military. See FORTIFICATION; TRENCHES.

TRENCH MORTAR. See GUNNERY.

TRENCHARD, trĕn'chard, **Stephen Decatur,** American naval officer: b. Brooklyn, N. Y., 10 July 1818; d. New York, 15 Nov. 1883. He was appointed midshipman in the navy in 1834, served in the Seminole War, was on the coast survey in 1845–46 and in 1847 was promoted lieutenant. He was engaged on board the *Saratoga* in the war with Mexico, was attached to the coast survey in 1853–57 and in 1857–60 served on the *Powhatan* on her diplomatic cruise to China and Japan. He was promoted commander in 1862, participated in both attacks on Fort Fisher and in 1866 received rank as captain. In 1871 he was promoted commodore, served on the examining board in 1871–72 and as lighthouse inspector on headquarters duty in 1873–75. He was advanced to the rank of rear-admiral in 1875 and in 1876–78 was in command of the North Atlantic squadron. He was retired in 1880.

TRENCHES. An entrenched zone consists of an entire system of trenches and their auxiliaries, composed of wire entanglements and other obstacles, listening posts, lookouts, machine-gun emplacements, fire trenches, communicating trenches, trenches for reserves and

supports, command posts, cave shelters, latrines and the like, occupied or susceptible of being occupied by a firing line and by its supports and local reserves.

Firing trenches are those designated primarily for delivering rifle fire against an infantry attack and are usually constructed in short lengths for a squad, section or platoon, arranged so that they are mutually supporting and thoroughly cover the ground by both frontal and flanking fire. If longer than required for a squad they should be of an irregular or indented trace and be traversed at intervals of from five to eight yards so as to give protection from enfilade fire and localize the effect of shell bursts.

If the firing trenches are located under fire when an attack has been halted the location is determined by the line at which the troops are forced to halt, and dig themselves in. This line may in some cases be a hostile trench captured in the course of the attack. Ordinarily each man will construct individual cover in the form of a lying trench, which he will gradually improve to a sitting, kneeling or standing trench. Small adjustments of position may be made by the officers with a view to getting the best possible line under the circumstances. The individual pits are connected up into squad or longer length when night falls, and the trace and location can then be rectified.

If the enemy has been found in a strong defensive position and an attack has not been made, or has resulted in a withdrawal, a line of firing trenches may be located under cover of night from 500 to 600 yards, or even more from the enemy, the exact distance depending upon the ground, the facilities for natural cover and the tactical condition. This line may be made fairly strong and complete before any further advance is attempted. Then under cover of darkness or fog, or a heavy bombardment, a new firing trench may be constructed at a distance of 200 to 300 yards from the enemy.

When not in the presence of the enemy a careful reconnaissance should first be made and the firing trenches can then be located with due regard to the terrain, the tactical requirements and economy of men.

The following general rules should govern the location of the firing trenches: (1) The field of fire should be such as to expose an attacking enemy to fire for at least the last 200 to 300 yards of his advance. To ensure this it may be necessary to clear the foreground. With well-trained troops a shorter field of fire may be sufficient, provided it is covered by frontal and flanking fire and is strengthened by a good obstacle, which should be well screened from the distant view of the enemy. (2) Concealment of the trenches is of the greatest importance. (3) The defenders should be screened from the enemy's view and sheltered from his fire by natural or artificial cover so arranged as to afford the maximum development of rifle fire. (4) The foreground should contain natural obstacles to break up the formations of attacking troops, but not afford them cover. (5) There should be good communications within the position and over ground that may be used for counter-attacks. (6) The trenches should not be placed too near unalterable features that reveal their location or furnish good range marks for the enemy. (7) The location of firing trenches on the crest or forward slope, though exposing them to view and bombardment, gives a feeling of superiority to the troops and increases their morale; enables the support, reserve, communicating and approach trenches to be well concealed; offers greater facilities for observation and for the assembly of troops for the assault close to the firing trenches and unobserved. (8) The location of firing trenches behind the crest of a slight ridge screens them from view and fire of the enemy's artillery, unless he has in his possession high ground giving a view of the reverse slope. Special conditions, such as the enemy's local superiority in artillery, may justify the deliberate choice of such a position, but it must not be too far down the reverse slope, arrangements must be made to deny the enemy access to the crest of the ridge and there must be a number of saps forward to the crest to allow a continuous observation of the front slope. (9) In woods the trenches should be located 10 to 20 yards from the front edge; the natural appearance of the woods should not be changed, but a clear field of fire obtained by cutting some of the brush, small trees and low branches.

Frequently trenches designed primarily for other purposes (such as cover trenches, communicating trenches, approach trenches) are in places prepared for occupancy by a firing line, with appropriate banquette, etc. Sometimes approach trenches may be prepared for firing in both directions. These are not firing trenches, as their use for firing is secondary.

Cover trenches are from 10 to 100 yards in rear of the firing trenches, to protect men of the firing line (except firing trench guards) during all but the infantry attack. It is not advisable to occupy firing trenches in force except when they are attacked by infantry. The bulk of the firing line should, therefore, be close at hand under cover, and to a certain extent the trenches which afford this cover facilitate lateral communication. They are often not continuous, and there obtains with them also the tactical requirement of dispersal. Cover trenches are amply provided with cave shelters, bombproofs and the like, and in places with firing banquettes, overhead cover and loopholes, or head cover. From the cover trenches, approach trenches proceed forward at frequent intervals to the communicating trenches or firing trenches. Usually at less frequent intervals are approach trenches entering the cover trenches from the rear.

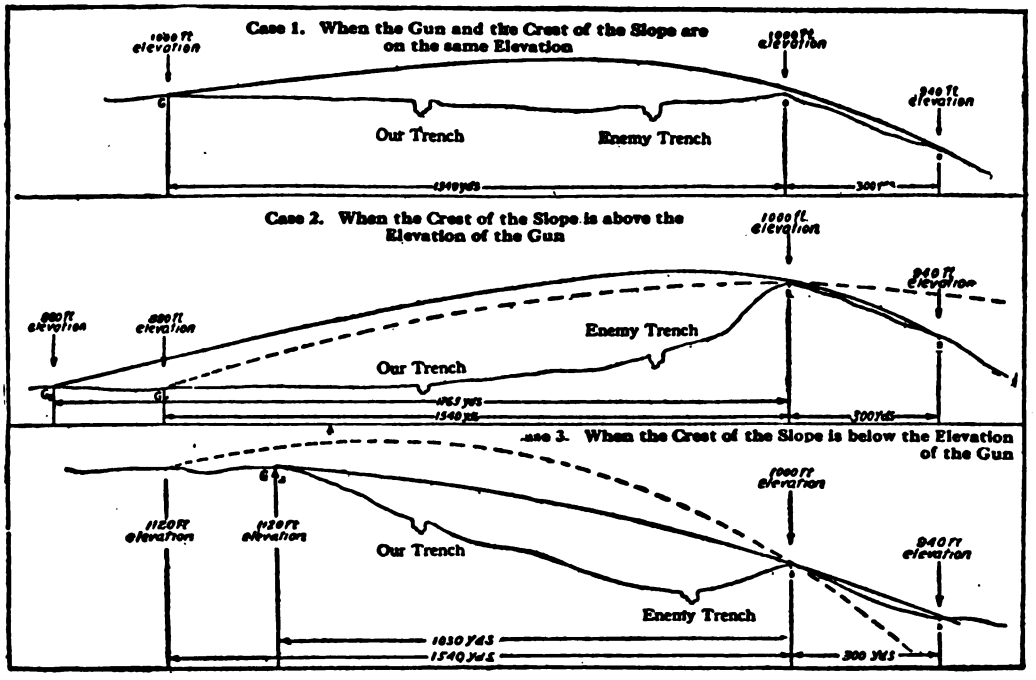
Communicating trenches are deep trenches used to afford proper lateral communication. They are frequently of short lengths, in front or in rear of the general line of the cover trenches, and generally opposite intervals between such trenches. Portions of the communicating trenches are prepared for fire and local supports may be sheltered in portions of them. Communicating trenches and cover trenches are connected by approach trenches; and where communicating trenches are in advance of cover trenches they are connected with the fire trenches by approach trenches relatively close together.

Approach trenches are those enabling one to pass within the intrenched zone from front to rear or vice-versa between firing trenches, cover

trenches, communicating trenches and other parts of the trench system farther in rear. Portions of approach trenches are prepared for firing, sometimes in both directions. They are deep, comparatively wide and winding, traversed or zigzagged.

Local trenches extend to observation stations, command posts, latrines, machine-gun emplacements and the like from firing, communicating, cover or other trenches.

over the parapet with proper effect so he can hit the bottom of his own wire entanglement. Traverses must be adequate. A parados must be provided to give protection against the back blast of high explosive shell; the trace of the trench should be irregular, to provide flanking fire; and if the trench is to be held for any length of time, the sides must be revetted and the bottom of the trench must be floored and drained. The drawings show the trench pre-


Case 1. When the Gun and the Crest of the Slope are on the same Elevation
Our Trench
Enemy Trench
Case 2. When the Crest of the Slope is above the Elevation of the Gun
Enemy Trench
Our Trench
Case 3. When the Crest of the Slope is below the Elevation of the Gun
Our Trench
Enemy Trench

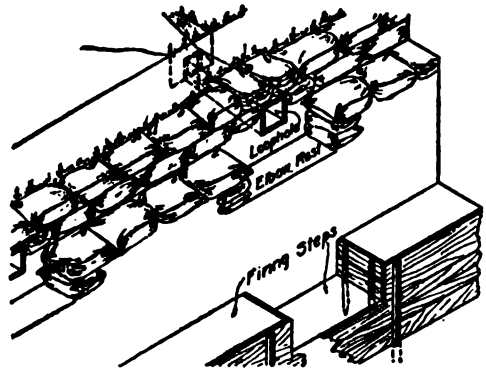
Long Range Searching or Barrage Fire and Profile of Trenches.

Support trenches are designed to shelter all of the troops who form the local supports of the firing line during hostile artillery fire, and a portion of them during the period of the infantry attack, if all are not then required farther forward. They are ordinarily similar in type of construction to cover trenches, but are located farther to the rear. Toward the front they merge into the cover trenches. Toward the rear they may be as remote from the firing trenches as 200 or 275 yards. Approach trenches provide communication from them to front and rear. Support trenches are sometimes provided with firing banquettes and the like, and machine-gun emplacements may be located among them. Often the ground is such as to permit the supports to occupy naturally sheltered positions, where support trenches may be much modified or omitted in places altogether.

Reserve trenches are trenches designed to shelter the local reserves. They are in rear of the support trenches, but often merge into them toward the front. While the firing trenches hold, reserve trenches are not ordinarily subjected to prolonged and severe artillery fire.

Every firing trench should fulfil the following essential conditions: The parapet must be bullet proof; every man must be able to fire

pared for firing through and over the parapet and typical sections for long range searching or barrage fire. The narrower the trench, the better the cover; but if too narrow it may hamper



Trench for Fire through and over the Parapet.

the movement of troops too much. Therefore, a firing trench is usually made broad enough to allow of movement behind the line of men manning the parapet. Every man must be able to use his rifle over the parapet, and the men

moving behind must not have to stoop down in order to get their heads under cover.

The resulting section is, therefore, with a banquette or firing step 18 inches wide and four feet six inches (or five feet, if we allow for a small notch or hollow to hold the rifle) below the crest of the parapet, and behind this a deeper portion from 18 to 30 inches wide at the bottom and from six to seven feet below the crest line of the parapet. The firing step must have a level surface to give a firm foothold. It may consist of an earth step revetted with planks held in place by stakes.

The best type appears to be a trench with a firing banquette for five or six rifles in each bay, between two traverses, each six feet thick, and with the back part of the excavation formed into a communicating trench for observation and manning of parapets. This trench is somewhat deeper and three feet wide.

Types of communicating and approach trenches are now becoming fixed. In France the following seem to have been the normal: Communicating and approach trenches well to the rear six feet wide, those farther forward three feet wide and both types six feet eight inches deep. A communicating trench less than three feet wide at the bottom is sure to become jammed. This is the minimum to be allowed, and the work should be commenced with a width of not less than three feet eight inches at the top, so as to get three feet at the bottom, according to the stiffness of the soil.

Berms of one foot on each side of a sap or trench where earth is piled up are considered indispensable. They prevent sliding of earth and furnish a little shelf on which to place tools, bags, guns and other articles, in case troops want to pass the occupants; the double berm also makes it possible for infantry to get out of a trench when the emergency requires.

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TRENCK, trĕnk, BARON **Friedrich von der,** German adventurer: b. Königsberg, 16 Feb. 1726; d. Paris, 25 July 1794. His life was a succession of adventures scarcely less marvelous than the romantic and highly colored account he gives of them. He entered the Prussian service in 1740 and stood high in Frederick the Great's favor, until, supposedly through his love affair with the king's sister, he incurred the royal displeasure, which caused his first imprisonment, the beginning of no end of misfortunes; loss of property, numerous imprisonments and attempts at escape, dangerous wounds and perils of all kinds. The stories of how he broke out of several famous prisons are all most graphically described in his 'Selbstbiographie' (1787), and in one or more very popular English translations which have delighted the youth of four generations. All his wonderful adventures are told in a manner that reminds one of Munchausen's marvelous tales. The anecdotes interspersed give a vivid picture of the turbulent condition of court life at the time of Frederick the Great and Maria Theresa. His restless, adventurous temperament led him to Paris, when the Revolution was in full swing; he was there accused of being a secret emissary of foreign powers, and was beheaded by Robespierre's order. Consult Wahrmann, 'Friedrich Freiherr von der Trencks Leben, Kerker und Tod' (1837). His cousin, BARON FRANZ VON TRENCK, an equal hero and swashbuckler, has also written an autobiography (1748), which, however, has not attained the celebrity of the other's wonderful mixture of fact and imagination.

TRENDELENBURG, trĕn'dĕ-lĕn-boorg, **Friedrich Adolf,** German philosopher: b. Eutin, Germany, 30 Nov. 1802; d. Berlin, 24 Jan. 1872. He studied in Kiel, where he came under the influence of John Erich von Berger, and acquired his early philosophical training at Berlin, and was appointed professor in the university of that city. His writings embrace the whole field of philosophy, ontological, ethical and æsthetical. He set forth the ethical aspect of his philosophy in the treatise 'The Ethical Idea of Right and Law,' and the æsthetic aspect in 'Niobe' (1846); and 'The Cathedral of Cologne' (1853). He wrote also 'Natural Justice on the Ground of Ethics' (2d ed., 1860). His principal claim to distinction as a thinker rests on his acute criticism of the systems of Kant and Hegel.

TRENHOLM, George A., American merchant: b. South Carolina, 1806; d. Charleston, S. C., 10 Dec. 1876. He was one of the largest dealers in cotton in the South before the Civil War and during the war was engaged in blockade-running, endeavoring to obtain supplies for the Confederates from Nassau. He was appointed Secretary of the Confederate Treasury in 1864, but was taken prisoner later in that year and held until 1865, when he was pardoned by President Johnson.

TRENT, William Peterfield, American man of letters: b. Richmond, Va., 10 Nov. 1862. After study at the University of Virginia and at Johns Hopkins University, he was professor of English in the University of the South (1888–1900) and dean of its academic department (1894–1900). From 1892 to 1900 he was editor of the *Sewanee Review,* and since 1 July 1900 has been professor of English literature at Columbia University. He has published 'Life of William Gilmore Simms' (1892); 'English Culture in Virginia' (1889); 'Southern Statesmen of the Old Regime' (1897); 'Robert E. Lee' (1899); 'John Milton' (1899); 'The Authority of Criticism' (1899); 'War and Civilization' (1901); 'The Progress of the United States in the Century' (1901); 'A History of American Literature 1607–1865' (1903); 'Greatness in Literature and Other Literary Addresses' (1905); 'Longfellow and other Papers' (1910); 'Defoe—How to Know Him' (1916), etc. He has also edited 'Select Poems of Milton' (1895); 'Essays of Macaulay' (1897); 'Poems and Tales of Edgar Allan Poe' (1898); 'Balzac's Comédie Humaine' (1900); 'Southern Writers, Selections in Prose and Verse' (1905), and has collaborated in numerous literary undertakings, e.g., 'Colonial Prose and Poetry,' editions of Shakespeare and Thackeray and the 'Cambridge History of American Literature.' Since 1905 his chief work has lain in English history and literature 1680–1730, with special attention to Defoe, of whom he has written a biography and bibliography in 10 volumes still in manuscript.

TRENT (German, TRIENT, trē-ĕnt'), Austria, a town in the southwestern part of Tyrol, of which it is the capital, situated on the river Adige or Etsch, 19 miles northeast of the Lago di Garda. It is a historical city, being the capital of the Trindentini, about the 4th century. It has belonged to Italy, to Venice, Austria, Bavaria, France and again to the Austrian Tyrol. Among its numerous churches the most noteworthy are the cathedral, built in the 13th and 14th centuries in the Byzantine style, and entirely of marble; and the church of Santa Maria Maggiore, in which the meetings of the celebrated Council were held. A statue of Dante was erected here in 1906. The principal manufactures are silk, wine, brandies and sausages. Pop. about 30,000. See TRENT, COUNCIL OF.

TRENT, Canada, a river discharging into Lake Ontario through the Bay of Quinté. The greater part of its course of 175 miles consists of a series of large, irregular and elongated lakes, which have been canalized for a distance of 160 miles. The stream itself furnishes water power, and large quantities of lumber are floated down on it. It passes the towns of Peterborough and Trenton.

TRENT, England, a river rising in Staffordshire, and flowing in a general northeast direction through Derby, Nottingham and Lincoln counties, emptying into the Humber estuary near its head. It is 170 miles long, and navigable 95 miles for small vessels and barges. It is connected by numerous canals with Midland manufacturing cities.

TRENT, Council of. The 19th œcumenical council of the Catholic Church was that of Trent (1545–63). It ranks with Nicæa, Ephesus and Chalcedon as one of the greatest of the general councils. Hitherto the Church had been sundered by schism and riven by heresy in the East. Now the West was in revolt. The deposit of faith had been effectively defended against the onslaughts of Arius, Nestorius, Eutyches and Photius. Now Luther and the Protestant reformers had to be met. So the Council of Trent had a twofold purpose: First, clearly to define the teaching of the Church on the issues that Protestantism had raised; secondly, effectively to legislate against the abuses that had crept in among the clergy and laity. During the pontificate of Clement VII (1523–34), the Emperor Charles V had frequently urged the advisability of a general council as an effective means of stemming the tide of Protestantism. This means was purposed by Paul III (1534–49) from the very outset of his reign. The Pope's efforts were again and again frustrated by the bickerings and rivalry that marked the relations between Charles V and Francis I. So the Council of Trent was not opened until 13 Dec. 1545.

1. First Period (1545–47).— The first formal session of the Council of Trent was attended by the three papal legates — Cardinals Giovanni del Monte, Marcello Cervini and Reginald Pole — 4 archbishops, 22 bishops and 5 generals of religious orders. The right to vote was enjoyed by all of these fathers, though not by the 42 theologians and 9 canonists, who came to the council only as consultors. Paul III was fully aware that political chicanery would prevent many bishops from going to Trent. Yet the prospect of their absence was no hindrance to his determined will to convoke the council. The doctrinal and disciplinary authority of a general council does not depend on the number of the bishops that attend; but, in the last analysis, is consequent upon the infallibility and supreme jurisdiction of the Pope.

A very simple method of procedure was adopted by the council. The cardinal legates proposed the subjects to be discussed: a congregation of theologians drew up an elenchus of doctrines to be defined under each subject; committees and particular congregations debated each doctrine at great length; a general congregation went over the same ground in detail and fixed upon the content and wording of the decree; finally the council in formal session definitively voted on the decree. The thoroughness of this mode of procedure accounts for the long time that intervened between the formal sessions.

The first dogmatic decision of the Council of Trent was given 8 April 1546, in session IV, on Scripture and tradition. It "receives and venerates with equal love and reverence" both Holy Writ and divine tradition; determines the canon of the Bible; selects the Vulgate as the authoritative Latin version, to the exclusion of all other Latin editions of the Bible then current; and defines the right of the Church to interpret the inspired Word of God. In session V, 17 June 1546, Trent decreed the universality of the fall of the human race in Adam, and other doctrines concerning original sin. Then came the important matter of justification. Sixty-one general congregations, besides many committee meetings and special congregations, were devoted to this doctrinal issue and to the reform measures that were appended thereto. On 13 Jan. 1547, in session VI, the masterful decree was passed. It contains a preface, 16 chapters and 33 canons or condemnations Session VII, 3 March 1547, treated of the sacraments in general and of baptism and confirmation. The Smalkald War and an epidemic caused a majority vote of the council, in session VIII, 11 March 1547, to transfer its meetings from Trent to Bologna. Fourteen bishops remained at Trent; they were there detained by Charles V. Indeed, the emperor so interfered with the council that it came to no dogmatic decisions at Bologna, and 13 Sept. 1547 was suspended by Paul III.

2. Second Period (1551–52).— Julius III (1550–55), who as Cardinal del Monte had been first papal legate to the council, reconvened the synod at Trent, on 1 May 1551. His legates were Cardinal Marcellus Crescenzi, Archbishop Pighinus of Siponto and Bishop Lipomanni of Verona. Henry II of France prevented the French bishops from attending. Decrees on the sacraments of eucharist, penance and extreme unction were issued in sessions XIII–XIV. There were now in attendance, 3 legates, a cardinal, 10 archbishops and 54 bishops. Delegates from several Protestant princes were present at these two sessions. They demanded that the council define the supremacy of an œcumenical council over the Pope and postpone definitions on all points of controversy between Catholics and Protestants. The council refused to accede to their demands. Many particular and general congregations were then held in regard to the sacrifice of the mass. No

decree was decided upon. The council adjourned 23 April 1552 because of the nearness of Trent to the war zone of Charles V and Maurice of Saxony.

3. **Third Period (1562–63).**— On the death of Julius III, a former president of the council, Marcello Cervini, was elected Pope (1555); he took the name Marcellus II and reigned only 22 days. Paul IV (1555–59) vigorously carried out the reforms instituted by Trent; but did not reconvene the council. Pius IV (1559–65) was minded to do so. He was deterred by the pettifogging interferences of secular rulers. The Emperor Ferdinand wished a new council and not a continuation of the old; he insisted on the choice of some German city other than Trent as the place of meeting. It took some time to bring him and the rest of the Catholic monarchs to terms. The third period of the council began at Trent 18 Jan. 1562. The president was Cardinal Ercole Gonzaga; his assistant cardinal legates were Stanislas Hos, James du Puy, Jerome Seripando, Louis Simonetta and Marcus Siticus. Besides these legates, there were present a cardinal, 3 patriarchs, 11 archbishops, 40 bishops, 4 abbots and 4 generals of religious orders. The theologians numbered 34.

Bickerings with Emperor Ferdinand and lesser princes delayed the preparation of the decree on holy communion. This decree was most important in its dogmatic and disciplinary bearing. At the formal session XXI, 16 July 1562, the council decided that communion under the form of bread was sufficient for the laity. «For He that said, 'Except ye eat the flesh of the Son of Man and drink His blood, ye shall not have life in you' (John vi, 54), also said, 'If one eat of this bread, one shall live forever' (John vi, 52). And he that said, 'He that eateth my flesh and drinketh my blood, hath everlasting life' (John vi, 55), also said, 'The bread, which I shall give, is my flesh for the life of the world' (John vi, 52). And finally He that said, 'He that eateth my flesh and drinketh my blood, abideth in me and I in him' (John vi, 57), nevertheless added, 'He that eateth this bread shall live forever' (John vi, 59).» Moreover, the council vindicated to the Church the right to determine how the sacraments should be administered; whether, for instance, communion should be under one form or two. Session XXII, 17 Sept. 1562, clearly defined the teaching of the Church in regard to the sacrifice of the mass. Cardinals Gonzaga and Seripando died; they were replaced by the cardinal legates Morone and Navagero. Eighty-four theologians, among them the learned Jesuits Salmeron and Lainez, took part in the preliminary discussions on the sacrament of orders. Session XXIII, 15 July 1563, issued the definitions of Trent on orders and the hierarchy. By this the council had 235 voting members. Session XXIV, 11 Nov. 1563, had to do with the sacrament of marriage. In session XXV, the last, 3–4 Dec. 1563, besides the usual decrees of reform, were promulgated the doctrines of indulgences, and of the veneration of the saints, relics and images. Finally all those decrees were read and approved, which had been passed during the reigns of Paul III and Julius III. These Tridentine definitions were signed by 4 cardinal legates, 2 cardinals, 3 patriarchs, 25 archbishops, 167 bishops, 7 abbots, 7 generals of religious orders and 19 proxies for 33 absentees. Pius IV confirmed the decrees of the Council of Trent, on 26 Jan. 1564, by the bull «Benedictus Deus.»

Bibliography.— The dogmatic decrees of Trent are given in scientific and accurate form by Denzinger-Bannwart, 'Enchiridion Symbolorum' (11th ed., 1911). The classic on the council is being published by a German Catholic publication society, the Görresgesellschaft; the title of this monumental work is 'Concilium Tridentinum: diariorum, actorum, epistularum, tractatuum nova collectio.' Five volumes have thus far appeared: I, *Diariorum* p. 1, the commentary of Hercules Severolus (1901); II, *Diariorum* p. 2, the diaries (1–4) of Angelo Massarelli (1911); IV, *Actorum* p. 1, the acts of sessions 1–111 (1904); V, *Actorum* p. 2, the acts of sessions IV–VIII (1911); X, *Epistularum* p. 1, letters written from 5 March 1545 to 11 March 1547 (1916). The history of the council was written up *a parti pris* by Saroi, 'Istoria del concilio tridentino' (1619). Against him wrote Pallavicino, 'Istoria del concilio di Trento' (2 vols., 1646–57). Other works of moment are Dupuy, 'Instructions et lettres concernant le concile de Trent' (1654); Labbe-Cossart, 'Concilia' (xiv, 1672); Le Plat, 'Monumentorum ad historiam concilii tridentini spectantium amplissima collectio' (7 vols., 1781–87); Theiner, 'Acta geniuna ss. œcumenici concilii tridentini ab A. Massarello conscripta' (2 vols., 1874); Döllinger, 'Sammlung von Urkunden zur Geschichte des Konzils von Trient' (1876); von Sickel, T., 'Zur Geschichte des Konzils von Trient, Aktenstücke aus den österreichischen Archiven' (three parts, 1870–72); Druffel-Brandi, 'Monumenta tridentina' (i–iv, 1884–97); Lainez, 'Disputationes tridentinæ' (ed. Grisar, 1886).

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TRENT AFFAIR, The, in American history, during the Civil War, in October 1861, Capt. Charles Wilkes, United States navy, intercepted at sea the British mail steamer *Trent,* bound from Havana to Saint Thomas, and took off two Confederate commissioners, accredited to France, Messrs. Mason and Slidell, who were among her passengers. They were taken to Boston, and imprisoned in Fort Warren, but were released on 1 Jan. 1862, on the demand of the British government, and permitted to proceed to Europe. Secretary Seward accepted England's demand as an adoption of the American doctrine which denied the right of search.

TRENT NAVIGATION SYSTEM. See CANADIAN CANALS.

TRENTE ET QUARANTE. See ROUGE ET NOIR.

TRENTON, Canada, a town and port of entry in Hastings County, situated on both sides of the Trent River at its mouth in the Bay of Quinté, 90 miles northeast of Toronto, and at the junction of the Grand Trunk and Central Ontario railways. It has large manufacturing industries, and an extensive export trade in timber. Pop. 3,988.

TRENTON, Mo., city and county-seat of Grundy County, on one of the forks of Grand

River, and on the Chicago, Rock Island and Pacific and the Quincy, Omaha and Kansas City railroads, about 100 miles northeast of Kansas City, and 80 miles northeast of Saint Joseph. It was established in 1841, in 1857 was incorporated as a town, and in 1893 was chartered as a city. It is in an agricultural and stock-raising region, and nearby is a large coal field. The chief manufacturing establishments are flour mills, butter and cheese factories, cigar factory and machine shops. The shipments are chiefly farm and dairy products, livestock and coal. The educational institutions are public schools, the Jewett Norris Library, which was endowed of $15,000, and school of music and dramatic art. It has municipally owned waterworks, four banks, one national and three State banks with a combined capital of $230,000. Pop. 6,168.

TRENTON, N. J., city, capital of the State, county-seat of Mercer County, on the Delaware River, and on the Delaware and Raritan Canal, on the Philadelphia and Reading and the Pennsylvania railroads, about 59 miles southwest of New York City and 29 miles northeast of Philadelphia. It is in lat. 40° 14′ N., long. 74° 46′ 30″ W. It is at the head of navigation in the Delaware River, and a falls here yields water power. The ground area is nine square miles, and there are about 230 miles of streets. Two bridges cross the Delaware and connect with Pennsylvania.

Manufacturing.— Among the large industrial establishments there are 34 engaged in the manufacture of pottery products, including vitrified china, Belleek china, semi-porcelain, common china, and white granite; also sanitary earthenware, electrical specialties, porcelain bath tubs, vitrified and decorative tiles, terra cotta, drain-pipe and brick. These have made Trenton pottery famous all over the world. Nearly all the clay and all of the coal used in the pottery industry is brought to Trenton. The value of the products amounts to about $7,000,000 per annum, though they have run as high as $12,000,000. Trenton's iron industries (the great works of the John A. Roebling's Sons Company, manufacturing metal wire rope, fire-proof wire, lath, cables, etc., are here) and machine shops produce $5,000,000 per annum. There are 16 rubber works, making a great variety of products, and having sales approximating $30,000,000 each year. Other important manufactures are crackers, school and church furniture works, watches, oil cloth, tobacco goods, carriages and wagons. There are also anvil works, flint and spar mills, lumber yards and fertilizer works. There are about 70 different industries, comprising 540 concerns, representing approximately $50,000,000 capital. There are a total of 3,500 business places in the city.

Public Buildings.— The principal public buildings are the State capitol, the United States government building, municipal and county buildings, opera house, State prison, insane hospital, State home for girls, city library with 40,000 volumes, three hospitals, State arsenal and the Y. M. C. A. building. The Battle Monument, commemorating the battle of Trenton, is conspicuously located, and bears a bronze figure of Washington. The city has a large number of fine church and school buildings and business houses.

Churches and Charities.—The churches and missions in the city number about 75. There are about 15,000 Roman Catholics, 5,000 Methodists, 3,500 Presbyterians, 4,000 Baptists and 2,000 Episcopalians. The members of the Society of Friends, Orthodox and Hicksite, once a power in the community, have dwindled to less than 100. There is a State asylum for the insane, three large hospitals, a Children's Home, the Widows and Single Women's Home, and a number of smaller benevolent and charitable institutions.

Education.— Trenton has a number of noted educational institutions, among which are the State normal and model schools, the State school for deaf-mutes, an industrial school for girls, a large high school, 34 public elementary and primary schools, a school of industrial arts, one Roman Catholic college, eight parish schools, one academy, business colleges and several private schools. Educational classes are conducted under the auspices of the Young Men's Christian Association. There is a free public library, a beautiful white marble building, containing about 75,000 volumes; the State library and several school libraries.

Banks and Finances.— There are eight banks; the combined capital of the three national banks is $1,250,000; the deposits of all except two private banks are $16,622,740. The real estate of Trenton is assessed at over $70,000,000. The cost of city maintenance each year is about $1,650,000. The chief items of expenditure are, for schools, $500,000; for police department, $180,000; for fire department, $170,000; for lighting, $75,000.

Government.— Commission government has been established with five commissioners, having charge respectively of public affairs, revenue and finance, public safety, streets and improvements, parks and public property. The mayor has charge of public affairs and is advisory to the other commissioners. The city employees are under civil service control. The fire department has been completely motorized. The police and fire departments are removed, by law, from political control, and are effectively administered. The water supply of the city was municipalized in 1859, and is conducted with satisfaction to the inhabitants of Trenton. The consumption of water averages about 80 gallons per capita, and the reservoir capacity is 120,000,000 gallons. The board of health has taken an advanced position upon all questions of public sanitation, while the parks of the city, the main breathing ground being named Cadwalader, occupy about 150 acres. An effective system of sewer-drains and paved streets is being extended to all parts of the city, while macadamized roads lead to all nearby rural communities. A bronze statue of Washington, on a granite shaft, marks the place where Washington placed the cannon at the battle of Trenton. A monument to Gen. George B. McClellan is in Riverview Cemetery.

History.— The site of the southeastern portion of Trenton was occupied, as claimed by an influential body of scientists, as the home of man in the Ice Age. (See NEW JERSEY). Near the banks of the Delaware River, during the period of recorded history, was a village of the Unami sub-tribe of the Lenni Lenapé (Delaware) Indians. The name of the princi-

pal creek, Assanpink, running through the city, is a corrupted form of an Indian name meaning "place of stone implements." Many such objects are found in and near the city. The location was known to the Dutch and Swedish peltry traders, who before 1664 came to Trenton to exchange commodities with the Indians. The advent of the members of the Society of Friends at Burlington (1677) led to the development of the nearby territory. These settlers had abandoned the idea of earlier adventurers that precious metals were to be found along the Delaware, that the river was a northwest passage to China, and industriously began the work of colonization, based upon cultivation of land, and the stimulation of river commerce. As early as 1679, certain Englishmen petitioned for lands at "Ye ffalles of ye De La War," by which name the jagged rocks and accompanying rapids were known to the white men. Shortly afterward an unsuccessful settlement was attempted, the actual foundations of the city being laid, when by 1685, Mahlon Stacy built his mill near the junction of the Assanpink Creek and the Delaware River. The history of Trenton during colonial times was uneventful. Certain characteristics are notable. About 1720 the community became known as Trent's town, or Trenton, in honor of a local wealthy Scottish plantation owner, William Trent, Chief Justice of His Majesty's Supreme Court of Judicature for the Colony of New Jersey. The village was the point of contact between the East Jersey (Calvinistic) and West Jersey (Quaker) influences, so conspicuous in the early history of New Jersey, and which have left permanent impress. Located at the head of tide water, and upon one of the great highways between Philadelphia and New York, the community was closely in touch with both cities. As the shiretown of Hunterdon County, erected in 1714–15 from Burlington County, Trenton drew to itself much of the trade of the Upper Delaware as far as "The Forks," now Easton. This trade was conducted by means of canoes and "Durham boats," the latter large scows, drawing little water, built to convey grain and iron ore from the upper river to Philadelphia. In 1745, Trenton became a borough, under royal grant, her charter being surrendered in 1750. Thereafter, the village remained a part of a township of the same name until the opening of the constitutional period. In 1758 and 1759 "barracks," standing in part and patriotically preserved, were erected for the housing of the Crown's regular and provincial troops — a step made necessary by reason of Indian outbreaks in the upper Delaware, during the French and Indian War.

The outbreak of the Revolution found sentiment in Trenton divided. Broadly, the Presbyterians were favorable to war, the Society of Friends were non-combatant, while the members of the Church of England leaned toward support of royal government. A "committee," in the village of about 600 inhabitants, was active in establishing communication between the Whigs of New York and Philadelphia, and as early as 23 May 1775 a Provincial Congress of New Jersey met in Trenton, a principal motive for assembling being the providing for militia regulation in the colony. It was near Trenton that General Washington, en route to take command of the army, upon 23 June 1775, first heard the news of the battle of Bunker Hill. Thence, until Trenton became famous as the spot where was fought one of the great, if not the greatest battle of the Revolution, the village life was without particular incident.

It was upon 8 Dec. 1776, after his memorable "retreat through the Jerseys," that General Washington succeeded in conveying his little army across the Delaware at Trenton, and occupied a ferry-town, later known as Morrisville, named in honor of Robert Morris, the financier of the American Revolution. During the flight of Washington from Fort Lee to Morrisville, it was that Thomas Paine wrote the memorable words, "These are the times that try men's souls," words that later brought the then unexpected response from Lord Germain, colonial secretary of state, "All our hopes were blasted by that unhappy affair at Trenton." The fate of a nation hung in the balance. The Anglo-Hessian troops were in control of New York and quartered at Amboy and New Brunswick, and were raiding for supplies throughout East Jersey. Rall, the Hessian commander, occupied Trenton, with outposts stretched for 20 miles north and south of the city. Philadelphia was threatened, and the Whigs in that city were almost panic-stricken. Washington wrote, "No man, I believe, ever had a greater choice of difficulties and less means to extricate himself from them." Congress, charging Washington with dictatorial powers, fled from Philadelphia to Baltimore, while Eastern Pennsylvania and much of New Jersey were overrun with Tory sympathizers and a riff-raff ready to follow the flag that was in the ascendency. Disappointed in not meeting General Lee, and chagrined at his capture, Washington disposed his force of 10,000 men along the west bank of the Delaware. Four brigades, under Generals Stirling, Mercer, Stephen and DeFennoy held the river fords from New Hope to Yardley; General Ewing occupied Morrisville, opposite Trenton, and Colonel Cadwalader held Bristol, 10 miles below. Taking advantage of the fact that the Hessians would celebrate Christmas with feasting and drinking, Washington prepared to rid West Jersey and Philadelphia of all danger from Anglo-Hessian occupancy. Cadwalader was to cross at Bristol and drive the king's troops from Burlington County, Ewing was to take position south of Trenton, holding Rall's men in check, while Washington was to cross the river nine miles above Trenton, and by a sudden descent capture or destroy the Hessian garrison in the village. Only one part of the plan was made effective. With 2,400 men and 18 pieces of artillery, Washington crossed the river, in a northeast storm, upon the early morning of December 26. Advancing quietly along the road from a point now known as Washington's Crossing, then called McConkey's Ferry, General Washington led his men through sleet and snow and over frozen ground to a point where the highway forked. The army separated about four miles from the village, one division being commanded by Washington, the other by General Sullivan. Both divisions reached Trenton shortly after sunrise. Immediately confusion seized the Rall, Von Lossburg and Von Knyp-

hausen regiments there quartered. Their pickets were driven back, and the battery of Capt. Alexander Hamilton, stationed near the present Battle Monument, swept one of the three principal streets of the town. Rall was wounded unto death, and finding themselves caught in a cul-de-sac, the regimental commanders surrendered at various points in the village. No American officer or enlisted man was killed, and only four were wounded. The Anglo-Hessian loss was about 20 killed and 75 wounded. Nine hundred and eighteen men were captured by Washington, who, during the same day, recrossed the river, with 1,000 of his own men reported unfit for duty. While the battle of Trenton was being fought, neither Ewing at Morrisville nor Cadwalader at Bristol was able to co-operate with Washington, owing to the river being filled with ice floes.

Two causes may be said to have operated to secure the defeat of Colonel Rall. One was the ill-feeling undoubtedly existing between the Hessians and the English, and the consequent lack of discipline. Rall, who had early been warned of Washington's preparations, was drunk upon the night previous to the battle and neglected all customary preparations to meet a foe for whom he had contempt. Washington immediately took advantage of the electrical effect that the battle produced. He recrossed the river from Pennsylvania and upon 2 Jan. 1777 occupied Trenton, with strong outposts established nearby at the villages of Bordentown and Crosswicks. The British generals, Cornwallis and Grant, with 8,000 Anglo-Hessian troops, advanced toward Trenton from New Brunswick, 30 miles distant, fighting their way inch by inch. Through the centre of Trenton passes the Assanpink Creek, then well wooded and surrounded by marshy soil. Washington crossed to the south side of the stream, occupied rising ground, leaving the main part of Trenton to the king's troops. Determining to capture the British stores at New Brunswick, strike a blow at Colonel Charles Mawhood's regiments at Princeton, and in a month regain partial control of "the Jerseys," over which he had been pursued, Washington escaped from Trenton at midnight 3 January. Leaving his camp fires brightly burning, he marched to the eastward of Trenton and early in the morning fell upon Mawhood at Princeton, defeated him, and made away for winter quarters at Morristown. At the battle of Princeton, Gen. Hugh Mercer, for whom Mercer County is named, was brutally stabbed and soon died. During the remainder of the Revolution Trenton was an important centre. To the village were brought spoils captured by the Whigs, and during the British retreat from Philadelphia to Monmouth an attempt was made to divert a body of Anglo-Hessian troops for the purpose of raiding the town. Here met the Committee of Congress that attempted to dispose of the question of the Pennsylvania-Connecticut land grants, which at the close of the Revolution so seriously affected the rights of the settlers in the Wyoming Valley. In 1782, 153 inhabitants of Trenton formed an association to prevent the importation of British goods, and bring all sellers and purchasers to a realization of the dominant Whig spirit. This action was taken to meet a trade-policy begun by British merchants, when it was found that for the purpose of conquering the United States the war was a failure. In June 1783 the Congress of the Confederation, torn by internal dissensions and State prejudices, a wandering body, abused, threatened and insulted, undertook the establishment of a Federal capital, requesting various States to yield to the United States jurisdiction over any district to the extent of 20 miles square and to grant £30,000 in specie for purchase of lands and erection of Federal buildings. Trenton being suggested as a suitable location, a contest between the South and New England was precipitated. A compromise was effected to the end that Congress should meet alternately in Trenton and Annapolis, a plan described by Francis Hopkinson as a new mechanism in government, of a pendulum-like character. Congress met in Annapolis, and a patriotic Trentonian who died in December 1783, made a bequest of £100 to Congress if that body would settle itself at Lamberton, now the southern part of the city. On 1 Nov. 1784 Congress met in Trenton, and an ordinance was passed to lay out a Federal city upon either bank of the river and to provide suitable buildings at a cost of not over $100,000. Congress adjourned to New York, where it met 11 Jan. 1785. Ultimately in the autumn of 1785 the South defeated the appropriation measure, and thus died the plan to make Trenton the capital of the United States.

Before the close of the 18th century, Trenton accorded a reception to President Washington upon 21 April 1789, while he was on his way to New York to attend his, the first, inauguration. A triumphal arch was erected over the Assanpink bridge, while maids and matrons strewed his way with flowers. The Federal government was conducted at Trenton during a smallpox epidemic in Philadelphia immediately before the removal of the public offices to Washington. Upon 25 Nov. 1790, Trenton, after a long contest between East and West Jersey, was chosen, as a compromise, to be the capital of the State, and two years later received a charter as a city, with only minor officers authorized to be selected by a limited electorate. This class legislation, characteristic of the conservative spirit of early State legislation, lasted until the adoption of a State constitution in 1844.

The year 1804 was notable in the history of Trenton for the opening of a bridge across the Delaware River, making an all land stage route from Jersey City to Philadelphia, and the chartering of the Trenton Banking Company, which, with a bank at Newark, organized the same year, were the first in the State. By 1830 Trenton contained about 5,000 inhabitants. With agitation concerning the development of water power, the improvement of highways, the construction of the Delaware and Raritan Canal, and the building of lines of railway to unite New York and Philadelphia, the city entered upon an industrial life. Within 10 years, Trenton had direct communication by land and water with all of the growing cities of the Atlantic seaboard, and her manufactures commanded national attention. Before 1860, her potteries and her metal industries had become well established, although both traced their origin, by sporadic development, to Revolutionary times. Later came the third of Tren-

ton's great industries, that of the rubber goods manufacture. The later history of Trenton is largely the record of commercial development and of steady growth.

Prospective Growth.— Owing to advantageous location upon the lines of great railway systems, its position at the head of tidal navigation, and the slight resistance offered by geological conditions, Trenton is destined to advance rapidly as an industrial centre. The growth of the city is purely normal, the city itself meeting all reasonable demands made by the congesting tendencies of population. An extensive system of trolley lines, one of which unites Philadelphia and New York, has given Trenton a distinctive impulse. Pop. (1900) 73,307; (1910) 96,815; (1918, est.) 110,000.

Bibliography.— Lathrop, J. M., 'Atlas of the City of Trenton and Borough of Princeton' (Philadelphia 1905); Lee, 'History of Trenton' (Trenton 1895); Raum, J. O., 'History of the City of Trenton' (ib. 1871); Volk, Ernest, 'Archæology of the Delaware Valley' (Cambridge, Mass., 1911).

TRENTON, Tenn., city, county-seat of Gibson County, on the Mobile and Ohio Railroad, about 82 miles northeast of Memphis. It is in a fertile agricultural region in which an excellent quality of cotton is grown. The chief manufacturing establishments are cottonseed-oil mills, cotton compress, a large cotton mill, box factory, flour mills and foundries. The educational institutions are the Peabody High School, Laneview Academy, graded elementary schools and a library. Pop. 2,402.

TRENTON FALLS, a series of six beautiful cascades in West Canada Creek, Oneida County, New York, 15 miles north of Utica. The cascades appear at intervals as the creek passes through a ravine two miles long. The total descent, in the two miles, is 312 feet.

TRENTON STAGE, that interval of geologic time during which the Trenton strata of New York and Canada and the equivalent beds of other regions were laid down. Trenton strata are typically developed in the Mohawk Valley in New York State, the type locality being Trenton Falls on the South Canada Creek near Utica. The beds are typically limestones of a dark color and often argillaceous. They are very fossiliferous, among the common species being *Rafinesquiva alternata, Plectambasites sericea, Dalmanella testudinaria, Prasopora tycopordon, Calymmemrenaria, Trinucleus concentricus, Araphus gigas,* and many others. The formation is well developed in the valley of Lake Champlain and in the Upper Saint Lawrence Valley. In southern and central New York the formation is buried by several thousand feet of later strata. Where thus buried it is sometimes a reservoir of gas and oil. In the Upper Mississippi region it is represented by the Galena limestone. On the Cincinnati anticline it underlies the typical Cincinnati beds. In the Hudson Valley it is in part represented by shales carrying a graptolite fauna with *Dicellograptus, Cocnograptus* and other types. In age the formation is Middle Ordovician. See PALÆOZOIC; ORDOVICIAN; CINCINNATI ANTICLINE, etc.

TREPANG, in zoology, a popular name for several edible tropical holothurians (q.v.), especially *H. edulis* of the Oriental seas. It reaches two feet in length and when dried forms an important article of food in China, called by the French *bêche de mer.* About 35 varieties are enumerated by traders, but only five or six have any real commercial value. To prepare them for the market the viscera are removed, and the animals boiled for about 20 minutes, then soaked in fresh water, and afterward smoked and dried. The curing process occupies about four days, during which the trepang must be kept very dry, for it readily absorbs moisture from the atmosphere. The final product is an uninviting rubber-like substance, which is used to prepare a thick soup, much liked in China and the Philippine Islands. Trepang is largely prepared by the Chinese in Hawaii and California from local holothurians, both for local consumption and for export to China. Consult Simmonds, 'Commercial Products of the Sea,' and similar books.

TREPHINE, trĕ-fēn' or trĕ-fīn, a surgical instrument consisting of a cylindrical or crown saw about one-quarter to one inch in diameter, with a cross handle like that of a gimlet, and a centre-pin which, when the instrument is used, is thrust forward a little beyond the level of the teeth of the saw so as to secure accurate implantation and prevent sliding. It resembles in some respects the trepan, and both are used to remove a circular disc or button of bone from the skull. This operation is known as trephining or trepanning, and is resorted to for the purpose of relieving the brain from pressure or irritation. It has been employed in simple fractures with signs of compression; in compound fractures with depression and apparently no compression; in punctured and gunshot fractures, even without symptoms; in coma, from meningeal abscess, hemorrhage and tumors; and in epilepsy and insanity, where lesions could be definitely localized.

TREPORT, Le, a French town situated at the mouth of the Bresle River, 45 miles northeast of Rouen. It is notable for its 16th century tower, the Church of Saint Jacques and an ancient Renaissance house. Its proximity to Paris makes it a popular bathing resort. It has a good harbor and a canal extending to Eu. Pop. about 4,000.

TREPOV, Dmitry Feodorovitch, Russian soldier: b. Saint Petersburg, 1855; d. there, 1906. He entered the army in 1874 and after taking part in the Russo-Turkish War retired in 1896 with the rank of colonel. He was made chief of police of Moscow but was removed in 1905 because of conflicts between the police and students, only to become Governor-General of Saint Petersburg and later Assistant Minister of the Interior with command of the entire police force of the empire. In the latter part of 1905 he became commandant of the Imperial palace where he died.

TRE'R CEIRI, trār chā'rī, the ruins of an ancient British fortified town situated in the northwestern part of Wales, six miles south of Carnarvon. The surrounding fortifications and substantial stone walls of the Cytian-houses or huts are still standing. An investigation in 1903 disclosed a number of Celtic bronze and iron implements and ornaments, specimens of Celtic pottery, and porcelain beads of Egyptian

manufacture, which place the date of the fort at about the 2d century A.D.

TRESCOT, trĕs'kŏt, **William Henry,** American diplomat: b. Charleston, S. C., 10 Nov. 1822; d. Pendleton, S. C., 4 May 1898. He was graduated from the College of Charleston in 1840, studied at Harvard, and was admitted to the bar in 1843. He was secretary to the United States legation at London in 1852–53, assistant secretary of state for South Carolina in 1857–60, resigning upon the secession of that State. In 1862–66 he served in the State legislature and after the close of the war was sent to Washington as the representative of his State during the Reconstruction period. He removed to Washington in 1875 and engaged in law practice there. He was appointed counsel for the United States before the fishery commission at Halifax, Nova Scotia, in 1877, was one of the commissioners to revise the treaty with China in 1880, represented the United States in reference to her rights on the Isthmus of Panama in 1881, and in 1882 was commissioner with General Grant to conclude a commercial treaty with Mexico. He was subsequently engaged in the practice of law at Washington. He published 'A Few Thoughts on the Foreign Policy of the United States' (1849); 'An American View of the Eastern Question' (1854); 'The Diplomatic History of the Administrations of Washington and Adams' (1857), etc.

TRESGUERRAS, Francisco Eduardo, Mexican painter, sculptor and architect: b. at Celaya, 1745; d. 1833. He was educated at San Carlos Academy in Mexico City and was noted as a painter and sculptor in his youth. He designed the Church of Our Lady of Carmen at Celaya, conventual churches at San Miguel de Allenda, a bridge at La Laja and other structures. He was widely known also as a poet and a musician.

TRESHAM, Francis, English courtier: b. about 1567; d. 1605. He was imprisoned for taking part in the Essex rebellion (1601) and was implicated in other plots including Winter's mission to the king of Spain. He died in prison as the result of his intriguing.

TRESPASS is a legal term applied generally to any wrongful entry upon the property of another, and also to mild assaults upon the person, but more especially applied to peaceable, but unlawful entry upon another's property for which there is a remedy by action, for damages. Any person entering the house or grounds of another may be expelled by force, if such is necessary, but trespass is justifiable where the intrusion is for a lawful purpose — as to pay or demand money lawfully due, or to serve any legal process, and forcible entry may be made to execute a criminal process. One who aids and abets the perpetration of a trespass is liable with the one committing same. The straying of one's cattle on another's property has been declared trespass in some jurisdictions. A trespass is deemed wilful when the trespasser has received notice not to intrude, and it is malicious, where the intrusion is designed for the purpose of injury, or annoyance. One in possession of real estate can generally maintain an action against one trespassing against his rights, and such possession can be either in person or by tenant. Trespass may be committed on a highway or road by one who has the use of same against the owner of property adjoining it, and against one who may unlawfully obstruct such highway or road. Any unlawful interference with another's goods or property is trespass, it not being necessary to take actual possession of the same; the taking of one's goods or property by accident, or error, constitutes trespass, unless in the event of some justifiable cause. In many of the jurisdictions there exists by statute, criminal actions for trespass, where the same is wanton or malicious. A trespasser is responsible for the natural consequences of his wrongful or negligent act, but where no special injury is shown, only nominal damages, as a rule, can be recovered. Poaching is a non-legal term applied to trespassing on the property of another for the purposes of killing and stealing game or fish.

TREU, George D. C., German archæologist: b. Saint Petersburg, 1843. Educated at the universities of Dorpat and Berlin, he taught in the latter university (1882) and took part in the excavations at Olympia (1877–81). He published 'Hermes and Praxitiles' (1878); 'Excavations at Olympia' (1879–81); and a number of other works relating to archæological discoveries.

TREVELYAN, trĕ-vĕl'yan, **Sir Charles Edward,** English statesman: b. Taunton, Somerset, 2 April 1807; d. London, 19 June, 1886. He was educated at the Charterhouse and Haileybury College, and entered the East India Company's Bengal civil service in 1826. He returned to England in 1838 and in 1840 was appointed assistant secretary of the treasury. He was knighted in 1848 for his services during the Irish famine, and later, with Sir Stafford Northcote and others, was instrumental in throwing open the civil service to competition. In 1859 he was appointed governor of Madras, but was recalled in 1860 for having protested against a new system of taxation imposed in India. He became Finance Minister in India in 1862, and during his administration introduced various fiscal reforms and also promoted the extension of public works. He resigned because of failing health in 1865, and after his return to England engaged in numerous charitable enterprises. He was created a baronet in 1874. He wrote 'Education of the People of Ireland' (1838); 'The Purchase System in the British Army' (1867); 'Christianity and Hinduism Contrasted' (1882).

TREVELYAN, George Macaulay, English historian: b. 16 Feb. 1876. He was educated at Harrow and at Trinity College, Cambridge; entered the war service (1915–18) and was awarded a medal for valor in Italy. His publications include 'England in the Age of Wycliffe' (1899); 'England under the Stuarts' (1904); 'Garibaldi's Defense of the Roman Republic' (1907); 'Garibaldi and the Making of Italy' (1911); 'The Life of John Bright' (1913), etc.

TREVELYAN, Sir George Otto, English biographer, historian and politician: b. Rothley Temple, Leicestershire, 20 July 1838. He was educated at Harrow and Trinity College, Cambridge, was for several years in the Indian Civil Service, sat in the House of Commons in 1865–68 as the representative of Tynemouth in the

Liberal interest, and in 1868 was returned by the Hawick or Border Burghs. He was appointed a civil lord of the admiralty in Gladstone's administration of 1868, but resigned in 1870 because he disagreed with his colleagues on the Elementary Education Bill. He was prominently identified with the movement for the abolition of the purchase of army commissions, and he was a leading advocate of the electoral reforms effected in 1884–85. In 1880 he accepted the post of parliamentary secretary to the admiralty, and in 1882, after the murder of Lord Frederick Cavendish and Mr. Burke, he went to Ireland as chief secretary to the lord-lieutenant. In 1884 he entered the cabinet as chancellor of the Duchy of Lancaster, and on the formation of Gladstone's short-lived ministry in 1886 he accepted office as secretary of state for Scotland. He resigned less than two months later because he could not support the Home Rule policy of the ministry, and in June of the same year succeeded to the baronetcy. He failed to secure re-election as a Unionist after the dissolution of 1886, but in 1887 he was returned as a Gladstonian Liberal for the Bridgeton division of Glasgow, a constituency which he represented continuously from that date till his retirement from political life early in 1897. In the Liberal government of 1892–95 he was secretary for Scotland. He is favorably known as an author by the following works: 'The Competition Wallah' (1864), a series of letters on Indian matters reprinted from *Macmillan's Magazine;* 'Cawnpore' (1865); 'The Ladies in Parliament, Horace at the University of Athens, and other Pieces' (1868); 'Speeches on Army Reform' (1870); 'The Life and Letters of Lord Macaulay' (1876), an admirable biography of his uncle; 'The Early History of Charles James Fox' (1880); 'The American Revolution' (4 vols., 1909), a strongly panegyrical work, containing many interesting side-lights on the statesmen and soldiers of the period; 'Interludes in Prose and Verse' (1905); 'George III and Charles Fox' (Vol. I, 1912; Vol. II, 1914). See MACAULAY, TREVELYAN'S LIFE OF.

TREVENA, John (ERNEST GEORGE HENHAM), English writer: b. about 1873. He led a wandering life for 20 years on account of ill health but was a prolific writer. Under his own name (Henham) he published 'Menotah: A Tale of the Canadian Northwest' (1897); 'Bonanza: A Story of the Outside' (1901); 'The Plowshare and the Sword' (1903) and others. Under his pseudonym appeared 'Furze the Cruel' (1907); 'The Dartmoor House that Jack Built' (1909); 'Adventures among Wild Flowers' (1914), etc. Consult Cooper, F. T., 'Some English Story Tellers' (New York 1912).

TREVES, trēvz, **Sir Frederick,** English surgeon: b. Dorchester, 15 Feb. 1853. He was educated locally, but developed a talent for surgery, and in 1881–86 was professor of anatomy and pathology in the Royal College of Surgeons. He was examiner in surgery at Cambridge University, and during the Boer War accompanied General Forbes to South Africa as consulting surgeon, and was with the relief column at Ladysmith. He held the post of surgeon extraordinary to Queen Victoria, 1900–01, and performed the operation for appendicitis on King Edward VII, 24 June 1902. He was created a baron during the coronation season. He is the author of works on physical education, surgery and anatomy, and has also published a 'Tale of a Field Hospital' (1900).

TREVES, trēvz (Fr. trâv; Ger. **TRIER,** trēr), Prussia, a town of the Rhine province, situated on the Moselle, six miles from the boundary of Luxemburg and 25 miles northeast of the city of Luxemburg. Outside of southern France no city of Europe north of the Alps contains so many and so well preserved remains from the Roman period as Treves. There are a large amphitheatre built by Trajan, an old Roman gate, the "Black Gate," large and magnificent Roman baths in one of the suburbs, the picturesque ruins of a palace of the Roman emperors, an old church, originally a Roman administrative building, and several other Roman buildings in the surroundings of the city. Portions of the cathedral and the foundations of the bridge across the Moselle are also Roman. The cathedral guards the Holy Mantle, believed to be the shroud in which Christ's body was wrapped. The provincial museum also has a rich collection of antiquities. The municipal library contains over 100,000 volumes. The industries are very varied, the most important being iron foundries, textiles, furniture, tanning, dyeing and joinery. In the neighborhood are lead and copper mines and gypsum quarries. Treves is one of the most ancient towns of central Europe. It was originally the capital of a Gallic tribe called Treviri. During the 4th century it was often the residence of the Roman emperors, and later it became the seat of the powerful archbishops of Treves, who had temporal sway over a considerable territory. In 1794 the territory came under French control, and it was made capital of the department of Sarre. With the fall of Napoleon it passed to Prussia. Pop. of the commune about 47,000.

TREVET, Nicholas. See TRIVET, NICHOLAS.

TREVILIAN RAID and **BATTLE OF TREVILIAN STATION.** On 5 June 1864 General Grant ordered General Sheridan to take two divisions of cavalry and move into Charlottesville, destroy the railroad bridge over the Rivanna near that town, the Central Railroad from that point to Hanover Junction, if practicable, and then rejoin the army. To General Hunter, whom it was expected he would meet at Charlottesville, Sheridan carried instructions to unite with him and join the Army of the Potomac. Sheridan started on the morning of the 7th with Torbert's and Gregg's divisions and four batteries of artillery, in all about 8,000 men. He crossed the Pamunkey at New Castle Ferry, moved up the north bank of the North Anna, marching by way of Aylett's and Chilesburg, crossed both branches of the North Anna on the 10th and at night encamped a little over three miles northeast of Trevilian Station on the Central Railroad. He had heard the day before that General Breckinridge, with an infantry division, was moving up the railroad to Gordonsville and that the Confederate cavalry was marching in the same direction on the south side of the North Anna to intercept his own column, and during the night it was ascertained that it was in his front. General Lee had heard on the morning of the 8th that

Sheridan was on the march, and ordered Gen. Wade Hampton, with his own division of cavalry, to follow in the direction of Gordonsville, directing Gen. Fitzhugh Lee, with another division to follow Hampton as speedily as possible. Hampton had in the two divisions about 5,000 men and three batteries of artillery. On the morning of the 9th Hampton marched from Atlee's Station of the Virginia Central Railroad toward Beaver Dam Station, passed Louisa Court House on the 10th and encamped that night in Green Spring Valley, three miles northwest of Trevilian Station; Fitzhugh Lee near Louisa Court House, about six miles east of the station. During the night Hampton learned where Sheridan had encamped and determined to attack him at Clayton's store, about midway between Trevilian Station and Carpenter's Ford of the North Anna. His own division was to advance by way of the station; Fitzhugh Lee by the direct road from Louisa Court House to the store. Hampton started early, and by daylight had reached the station and was moving on the road to Clayton's store, with Butler's and Young's brigades, Rosser's brigade advancing by a road on his left, when Sheridan was encountered, having scarcely left his camp, Torbert's division in advance and about three miles from the station. There was a sharp skirmish between the advance parties, and Hampton dismounted his men and formed them in dense timber across the road. General Custer, with his brigade, was sent by a wood road on the left to strike the Louisa Court House road and move up in Hampton's rear, passed unnoticed and unopposed to his assigned position, captured many of the Confederate led horses and created much confusion. Sheridan says that as soon as he heard of this the two remaining brigades of Torbert's division were dismounted, assaulted Hampton's position, and carried it, though with severe loss, capturing many prisoners and driving Hampton's men at a run back on Custer at Trevilian Station, some of them through Custer's line, and that Custer began fighting in all directions, capturing many of the enemy. Hampton, however, says he was not driven from position, but that, finding Custer in his rear, he withdrew to a new position, and that Rosser punished Custer severely, driving him back against Fitzhugh Lee, who was coming up, recapturing some ambulances, wagons and three caissons, and taking in addition four caissons and Custer's headquarters wagon. General Gregg attacked Fitzhugh Lee on the Louisa Court House road, drove him and pursued until night. Hampton's division fell back in the direction of Gordonsville and, during the night, was joined by Fitzhugh Lee, who made a detour for that purpose. Sheridan encamped at Trevilian Station. At night Sheridan learned from some of his 500 prisoners that Hunter was moving on Lynchburg and that Breckinridge was at Gordonsville. He, therefore, determined to return, as his ammunition had been much reduced. On the morning of the 12th Gregg's division began the destruction of the railroad toward Louisa Court House and at 3 P.M. Torbert's division, reinforced by a brigade of Gregg's, went up the Gordonsville road to secure a by-road leading over Mallory's Ford of the North Anna, as Sheridan intended to return by way of Spottsylvania Court House. Torbert became heavily engaged with Hampton, the battle continuing until 10 P.M., the advantage remaining with Hampton. During the night Sheridan moved back by the route he had come, recrossing the North Anna at Carpenter's Ford, abandoning some of his very severely wounded, but carrying 377 with him in conveyances of every description, and some 370 prisoners. He reached the White House on the Pamunkey on the 21st, followed by Hampton, who moved on the south side of the North Anna. Sheridan's loss at Trevilian Station on the 11th and 12th was 102 killed, 470 wounded and 435 captured or missing. Hampton says he captured 570 prisoners in the battle and in pursuit, and that the loss in his own division was 59 killed, 258 wounded and 295 missing, a total of 612. The loss in Lee's division is not given. Sheridan marched from White House on the 22d, had a severe engagement with Hampton at Saint Mary's Church (q.v.) on the 24th, and on the 25th and 26th crossed the James River near Bermuda Hundred and rejoined General Grant. His entire loss, June 7–24, was 150 killed, 738 wounded and 624 captured or missing. Consult 'Official Records' (Vol. XXXVI); Humphreys, 'The Virginia Campaign of 1864–65'; Sheridan's 'Personal Memoirs' (Vol. II); The Century Company's 'Battles and Leaders of the Civil War' (Vol. IV).

E. A. CARMAN.

TREVISA, trē-vē'sa, **John,** English writer and translator: b. Cornwall about the middle of the 14th century; d. 1412. He was educated at Queen's College, Oxford, where he was an associate of Wyclif's, and on taking holy orders was appointed vicar of Berkeley, in Gloucestershire, and canon of the collegiate church of Westbury. His chief works are a translation of Higden's 'Polychronicon' (1837), one of the earliest specimens of English prose; of Occam's 'Dialogue between a Soldier and a Clerk,' and of 'Bartholomæus de Proprietatibus Rerum,' which last, a very mine of rare English words, stands in the list of proposed reprints of the Early English Text Society. Caxton said that Trevisa had also translated the Bible; but his version, if it ever existed, is not known to be extant.

TREVISO, Duke of. See MORTIER, EDOUARD ADOLPHE CASIMIR JOSEPH.

TREVISO, trā-vē'sō, Italy, the capital of the province of Treviso in Venetia, situated 16 miles north of Venice. Among its interesting buildings are the cathedral of San Pietro, begun in the 12th century and but recently finished, the large Gothic church of San Nicolò (1310–52), the recently restored provincial palace, a new and fine courthouse and the theatre. There is an academy of sciences, a seminary and technical school and at the Borgo Cavour a notable gallery of paintings and extensive library. The manufactures include hardware, machinery, paper, silk, woolens, chemicals and pottery; and there is a lively trade in grain and cattle. The province is 956 square miles in area and has 550 inhabitants to the mile. Pop. of the town, 43,597; of the province, 524,013.

TREVITHICK, trĕv'ĭ-thik, **Richard,** English engineer and inventor: b. Illogan, Cornwall, 13 April 1771; d. Dartford, Kent, 22 April

1833. In 1797 he succeeded his father as a leading engineer in Cornish mining. Among his first inventions was an improved pump, which soon came into universal use in deep mining. He next perfected a high-pressure steam-engine and began to experiment in the construction of locomotive engines. Passengers were first conveyed by steam by means of his road locomotive in 1801, and he soon after successfully worked a tramroad locomotive. His ideas were later taken up and developed by Stephenson. He was the first to recognize the value of iron in shipbuilding and the application of steam to agriculture. In 1816 he went to Peru, where several engines of his devising were in use in the mines, but the outbreak of the War of Independence 10 years later caused him to lose all his property there. After some adventures in Central America, where he met Robert Stephenson, he returned to England in 1827. His request for recognition and reward for his numerous inventions was disregarded by government, and during his latter years he was in great poverty. Consult the biography by his son Francis (1872).

TREVOR, trē'vor, Sir **John,** English statesman: b. 1626; d. London, 28 May 1672. He entered Parliament in 1646, but attained to no important position until 1659, when he became a member of Monk's council of state. Early in the reign of Charles II, however, he obtained some public employment in France, and in 1668 was again sent there, this time as a special envoy to negotiate a treaty. On his return to England he was knighted and shortly afterward was appointed secretary of state. He was reputed to hold non-conformist opinions, yet his position in the government required him to inquire into and to suppress, where necessary, sectarian meetings in parts of the kingdom. In 1671 he was named on the committee to investigate the petition of Irish landholders dispossessed by Cromwell.

TRIAD. See Harmony.

TRIAD, Hindu. See Trimurti.

TRIAL, Legal (from Old French *trier,* to try, to choose), the examination and determination of the issues between two parties by a judge with a jury, a judge without a jury or by a referee appointed by a court for the purpose, in either civil or criminal proceedings. The trial is that part of a legal action which consists of the court's investigation of the issues in dispute after the arraignment and hearing of the pleas. In a criminal case should the defendant plead guilty there is no trial, sentence being pronounced in the same manner as if the trial had been held and concluded. The trial embraces the opening of the case by the plaintiff's attorney with a concise statement of the cause of action, the examination of witnesses and evidence and the cross-examination of the witnesses by the counsel for the defense, if desired. The defendant's counsel in turn produces his witnesses, who may be cross-examined by the plaintiff's attorney. The defendant's attorney then argues his case and the plaintiff's argument closes the case, and, in civil cases, the trial. In criminal cases the trial includes the judge's charge to the jury and the rendering of the verdict, but does not include the sentence imposed by the judge, nor a hearing on appeal. See Issue; Judgment; Jury; Summary; Verdict.

TRIAL BALANCE. See Bookkeeping.

TRIAL BY BATTLE. See Battle, Trial by; Combat; Ordeal.

TRIANGLE, a figure with three straight sides; a plane figure bounded by three right lines. A spherical triangle is a portion of a spherical surface cut out by three planes which meet at the centre of the sphere and whose sides are each less than a semi-circle of the sphere. It may be equilateral, isosceles, etc. When a plane figure is formed by three arcs of circles intersecting two by two in three angles, it is a circular triangle. An equilateral triangle, having equal sides, is also always equiangular. An isosceles triangle, having two equal sides, has also two equal angles. An oblique triangle is one whose angles are all less than 90 degrees. See Trigonometry.

TRIANGLE, a musical instrument. See Orchestra, The, and Orchestral Instruments.

TRIANGLE. An instrument of hard rubber or similar material used for drawing lines at angles to a "T" square. The two forms commonly in use have right angles and an acute angle of 45°, or of 30°, or 60°.

TRIANGLE OF FORCES. See Mechanics.

TRIANGLE SPIDER. An insect common in the eastern United States, belonging to the *Uloboridæ* and called the *Hyptiotes cavatus.* It makes a web consisting of four radiating lines with a series of double cross lines and from the apex of the triangle a strong line extends to the supporting twig so that by jarring this it loosens the whole net, thus entangling insects in the cross threads.

TRIANGULATION. See Surveying; Geodesy.

TRIANON, Le Grand, le grăñ trē-ă nôñ, Versailles, France, a one-storied palace of considerable extent, formerly a private residence of the French sovereigns, and originally built for Madame de Maintenon by Louis XIV. The palace is visited for its historic interest; its numerous apartments retain much of the original furniture and contain several fine modern works of art. It is called the Grand or Great Trianon to distinguish it from the Petit Trianon.

TRIARTHRUS (triple jointed). An Ordovician trilobite having a depressed carapace of elongated oval outline, the middle third of which is occupied by the broad axis. The best known species is the *Triarthrus becki* of the Utica shales.

TRIASSIC, the oldest period of the Mesozoic era and the system of rocks then formed, so named from its threefold division in Germany, as follows: Transition or Rhætic, Upper Trias or Keuper, Middle Trias or Muschelkalk, Lower Trias or Bunter Sandstein. Of these divisions, the middle one alone is marine, and characterized by marine fossils. The Keuper consists of non-marine sandstones, marls and clays, often with coal seams. The Bunter consists of mottled red and green sandstones, marls and conglomerates with occasional beds

of dolomite, rock salt and gypsum. The typical marine Triassic series of beds is found in the Alps, Himalayas and Siberia. The Triassic is preceded by Carboniferous and followed by Jurassic. In various portions of California and other western States sections are obtained which cover each a greater or smaller interval of the entire Triassic column. Altogether the entire interval is pretty well covered by the various local sections, so that western North America furnishes a nearly complete series of marine Triassic strata. In other regions of North America the Triassic strata are chiefly non-marine. Such is the condition in the interior and such is the character of the Newark system of eastern North America (Nova Scotia, Connecticut Valley, New York, New Jersey and Pennsylvania to Virginia region and the isolated patches in Virginia and the Carolinas). In Europe the Triassic is often called the "New Red" sandstone, in distinction from the "Old Red" sandstone of the Devonian system. This name is little used in the United States.

In portions of the United States the rocks of this period are hardly separable from those of the Jurassic, so that they are frequently known to American paleontologists as "Juratrias." They are represented by various formations along the northern Atlantic Coast; and in this age were erupted the trap overflows whose remains are the Palisades of the Hudson, East and West Rocks, at New Haven, and other similar outcrops in Connecticut. In the interior the terrestrial red beds in the foot-hills of the Rocky Mountains are in part Permian, in part Triassic; and there are extensive marine Juratrias formations on the Pacific Coast, which was the only part of the United States to be extensively submerged during the period. Triassic strata are known over large areas in various parts of the Old World; and in all countries yield some of the best building stones and grits. The famous "Brownstones" of New England and New Jersey are of this age.

The life of the period is not greatly different from that of the Carboniferous, especially in the vegetation, as cycads, tree-ferns, etc., remained prominent. (See PALEOBOTANY). Fishes abounded. Reptiles multiplied on land, particularly the bipedal carnivorous Dinosaurs (terrible reptiles), which reached 40 feet in length, and were the animals that made the so-called "bird-tracks" of the Connecticut Valley. Marine forms also began to develop, such as mosasaurs, plesiosaurs and their relatives in all parts of the world. The most important and characteristic creatures of the time, however, were amphibians, especially of the Stegocephalian type. Compare JURASSIC. See GEOLOGY, and the authorities there cited. Also NEWARK SERIES; NEW RED SANDSTONE.

TRIBE, an aggregation of families of similar descent, united under a common leadership, and forming part of a nation, as in the case of the Roman tribes, or a small nation in itself, as the Sioux or the Cherokee nation of Indians. The tribe was undoubtedly the first step in social organization from the independent family—the human male and female living with their offspring apart from others of their kind, in cave or woods. The tribe was retained in political organizations even of an advanced stage, such as Athens and Rome. It was and is to this day the only form of organization among uncivilized races and it is retained by some of the civilized, such as the Highlanders of Scotland. The tribal system, while in itself a signal advance from the independent family, has generally been found an obstacle to social and political progress when brought into contact and rivalry with higher political development. The progress of Scotland was undoubtedly retarded by the tribal or clan system among the Highlanders and has been wonderfully rapid since the clans were virtually suppressed as political entities by the British government in the 18th century. The internal history of Russia has been largely a struggle of imperial and centralizing against tribal influences. The Indian tribes of America are slowly but surely becoming merged in the general population.

TRIBES, The Lost Ten. See LOST TEN TRIBES, THE.

TRIBUNE, the designation of certain Roman officials, civil and military, with varying rank and power. The title is plainly derived from the tribes which the tribunes represented and the early tribunes were no doubt commanders of the horse and foot furnished to the Roman army by the original tribes. The number of these military tribunes was increased with the number of the tribes; the kings, it is assumed, appointing them while the monarchy lasted, and the consuls succeeding to that power. As the division between patricians and plebeians grew wider the popular assembly became jealous of the consuls and demanded and obtained a voice in the appointment of military tribunes, the tribunes nominated by the popular body ranking as magistrates of the Roman people, as well as military officers. One of the tribunes, known as the *tribunus ærarius,* was the paymaster of the troops.

Far superior to the military tribunes and armed with a power of veto which made them superior even to the consuls, when it came to an issue of authority, were the "tribunes of the commons," created as the result of a long struggle between patricians and plebeians. In 494 B.C. the commons seceded, and took refuge on the Sacred Mount and bound themselves to stand by each other until the patricians should consent to the appointment of two officers to protect the plebeians in their rights. The patricians agreed to the demand and the tribunes of the people, who figured so prominently in the subsequent history of Rome, were created. Their powers increased enormously in the later years of the republic and were ultimately absorbed by the emperors. Consult Botsford, G. W., 'The Roman Assemblies' (New York 1909); Abbott, F. F., 'History and Description of Roman Political Institutions' (Boston 1911). See ROME.

TRIBUNE. An architectural term used to describe that portion of a structure from which an audience is addressed. The term is applied especially to the desk from which a legislator may address the French Chamber of Deputies or the Senate. It is also used to designate the apse of a church or a balcony or gallery for musicians.

TRIBUTE, a sum of money or other property paid by one person or state, at definite

intervals, to another person or state, as acknowledgment of submission or to secure protection or guarantee peace. The custom of giving tribute arose in very early days and was common among the Greeks and Romans. Later it appeared in England and elsewhere under the feudal system, at which time the term was not clearly differentiated from taxes and rent. Sometimes the right to levy tribute is given by treaty between two states. It may be in the form of a contribution raised by a sovereign to defray the expenses of the nation.

TRICERATOPS, a gigantic armored dinosaur found fossil in the Upper Cretaceous rocks of Wyoming. It was larger than a modern rhinoceros and had three great horns, two over the eyes, the other on the proboscis. The skull was phenomenal, a specimen measuring six feet by five, roughly triangular and broad at the rear. The heavy legs ended in three-toed feet. Though frightful of aspect, this great creature, normally 25 feet in length, was a vegetarian, with a most minute brain. See DINOSAURIA.

TRICHECHIDÆ. See PINNIPEDIA.

TRICHIASIS, an inversion of hairs about an orifice of the body, especially of the eyelashes. The inverted lashes irritate the ball of the eye and may cause ulceration and opacity of the cornea. Treatment consists in removal of the offending eyelashes and, when necessary, operative measures to correct the faulty position of the lids. The term trichiasis is also applied to hair-like filaments in the urine, the result of disease of the kidneys or bladder; to a matting and interlacing of hair (*Trichiasis coacta*) and to knotty swellings in the female breasts (*Trichiasis lactea*) from an accumulation and arrest of milk in the milk-ducts.

TRICHINA, a small nematode parasitic in the rat, pig, and man which is the cause of a much dreaded disease termed trichinosis or trichiniasis. The scientific name of the parasite is properly *Trichinella spiralis* and it is believed to have been originally a rat parasite from which host it went over into the hog and from that to man. Two stages are distinguished: (a) Muscle trichina, the immature form, encysted and inactive, and (b) intestinal trichina, the adult form, free and ultimately sexually mature. The species is highly specialized for the parasitic existence and the entire life history is passed within some host. The encysted trichina in muscle tissue if brought living into the stomach of some flesh-eater is set free by the digestion of the cyst. It passes into the intestine and within two and one-half days reaches sexual maturity. After pairing the male dies and the female grows greatly in size. The species is ovo-viviparous, and the first young are produced in about one week from the date of infection. Before giving birth to any, however, the female bores her way into an intestinal villus and lying with the genital pore in a lacteal vessel, pours out all the young into the lymph fluid. They are carried into the musculature and permeate muscle fibres which undergo granular degeneration, while a cyst is formed about each by an infiltration of round cells. Eighteen days are demanded to complete the process, and the young trichina coiled within the cyst is ready for transfer to another host; but it may wait even years before this transfer is effected. Meanwhile there is laid down in and around the cyst calcareous material which gradually encroaches upon and ultimately involves the entire capsule, transforming it to a granule of lime in the muscle. The original discovery of the trichina was made in a dissecting room in London by Dr. Paget who noticed that minute granules in the muscle dulled the edge of the scalpel, and on investigation found the parasite. The cyst may undergo fatty degeneration rather than calcareous. While very resistant against smoking, pickling and even decomposition of the meat, the trichina is readily killed by cooking, so that no danger attaches to the consumption of well-done pork. Prolonged cooking is necessary to bring the centre of large pieces of meat to the proper temperature. Epidemics of trichinosis were very frequent in the last century, especially in Germany where the consumption of smoked but uncooked ham is general. By a system of rigid meat inspection, carried out at large expense, the cases of the disease have been very greatly reduced in Germany. Epidemics have been rare in other countries, though, as will appear later, errors in diagnosis are easy if the disease is not suspected.

Symptoms.— The disease manifests three stages: (a) Intestinal irritation during the growth of the adult trichinæ; (b) myositis with rheumatic pains and fever due to the invasion of the muscles by the larvæ, and (c) period of subsidence corresponding to the encystment of the worms. The severity of the symptoms depends evidently on the individual but primarily on the number of encysted trichinæ that were ingested. Violent symptoms in the first stage have been mistaken for dysentery or cholera, and in the second for rheumatism, while confusion with typhoid is very common. The examination of a fragment of excised muscle will afford positive evidence of trichinæ if present.

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TRICHINIASIS. See TRICHINA.

TRICHINOPOLI, trĭch-ĭn-ŏp'ō-lĭ, or **TRICHINOPOLY,** India, a town in the province of Madras, situated at a railroad junction, on the South Indian Railroad, 190 miles south by west of Madras, on the right bank of the Kaveri River. It is defended by a fortress built on a steep rock, 275 feet high. The rock is crowned by a large pagoda, and another temple carved out of one side of it. It was under native government previous to 1801, when the British acquired control. The town manufactures cutlery, saddlery and jewelry. Pop. 123,512.

TRICHINOSIS. See TRICHINA.

TRICHOME (from a Greek word meaning «growth of hair»), the hair-like outgrowth from the surface of some plants. These may be either uni- or multi-cellular, and if they have flattened expansions at the top are called scales. Glandular hairs secrete various substances which may be either liquid or solid. Root hairs greatly increase the surface for the intake of water and play an important part in this respect. The trichome are used extensively by systematists in describing plants.

TRICHOPTERA. See CADDIS-FLY.

TRICLINIC SYSTEM. See CRYSTALLOGRAPHY.

TRICLINIUM, among the Romans the dining-room where guests were received, furnished with three couches, which occupied three sides of the dinner table, the fourth side being left open for the free ingress and egress of servants. On these couches, which also received the name of triclinium, the guests reclined at dinner or supper. Each couch usually accommodated three persons.

TRICOLOR (French *tricolor*), term applied to a flag having three colors, usually restricted to flags which have the colors in equal masses. See FLAGS OF FOREIGN NATIONS.

TRICOPHYTON. See BARBER'S ITCH; RINGWORM.

TRICYCLE. See BICYCLE.

TRIDENTINE CREED, the profession of the Tridentine faith, published by Pope Pius IV, in 1564. It originally consisted of the Nicene creed, with a summary of the Tridentine definitions, to which is now added a profession of belief in the decrees of the Vatican Council. See TRENT, COUNCIL OF.

TRIDYMITE, a mineral occurring in small, hexagonal tabular crystals in trachyte and other volcanic rocks. Chemically it is pure silica and therefore identical with quartz, from which it differs in its form and lower specific gravity, 2.3. It was first found in Mexico in 1868, but has since been recognized in many localities in Europe, New Zealand, Iceland and the United States. Probably the finest specimens come from Euganean Hills, northern Italy. Its name refers to its frequent occurrence in "three-fold" twin crystals, or trillings.

TRIENNIAL ACT, the name commonly given to the Act of Parliament 16 Charles II, "for the assembling and holding of Parliaments once in three years at least." This act was confirmed after the Revolution of 1688, by 6 William and Mary, cap. ii. The Septennial Act I George I, cap. xxxviii, passed 7 May 1716, empowered Parliaments to sit for seven years. This Act, again, was replaced by the Parliament Act of 1911, which reduced the life of a Parliament to five years.

TRIER. See TREVES.

TRIEST, trē-ĕst' (Italian TRIESTE, the ancient TERGESTEUM), Italy, one of the principal seaports of the kingdom, situated between Görz and Istria in the Coastland, and at the head of the Gulf of Triest, the extreme upper portion of the Adriatic Sea. The city rises from the water in an amphitheatre formed by the sloping escarpment of the Karst plateau. The old town has narrow and crooked streets, but in the newer portions, surrounding it on nearly all sides, the streets are broad and regular, with numerous open squares, ornamented with fountains and monuments. The cathedral of San Giusto stands on an eminence on the site of an old Roman temple. Other notable buildings are the magnificent city hall, the old exchange, the fine building of the Austrian Lloyd, the elegant palace of Revoltella, now a municipal museum, and the large *Teatro Politeama.* There are also remains of a Roman theatre and aqueduct. The principal educational institutions are the commercial and nautical academy, with an observatory, two German and two Italian high schools, a military academy, a public library and archæological museum. The manufactures include soap, candles, confectionery, playing cards and saddlery, and there are breweries, iron foundries, large petroleum refineries, machine shops, oil and lineoleum factories and shipyards. Of the 17 Austrian diets, that of Triest is the sixth in membership. The city is chiefly important for its commerce. During the last decade of the century, however, the progress was not so rapid, owing to keen competition, and to the fact that Triest ceased to be a free port in 1891, after having been so for nearly two centuries. A great extension of the harbor was undertaken about 1905, and completed shortly before the war. There was also much activity in railroad building. Triest has great shipyards and was the headquarters of the great Austrian Lloyd Steamship Company. In 1914 10,686 vessels of 3,871,346 tons were entered and 14,186 vessels of 5,475,445 tons cleared from this port. The principal articles of export are sugar, wool and woolen goods, paper, timber and coal, clothing, metal ware, instruments and watches and glassware. The chief imports are cotton, coffee, fruits and vegetables, hides and animal products, oil, flax and tobacco. Pop. of the city 170,000; of the province about 246,500. About 75 per cent of the people are Italians. It was under Austrian control from 1388 until the end of the World War in 1918, when it passed to Italy.

TRIFOLIUM. See CLOVER.

TRIFORIUM, *in Gothic architecture,* a gallery or arcade with a triple-arched front, above the arches of the nave and below the clearstory. While the triforium was named from its three arches, similar galleries were built and carried the name improperly, having two or four arches.

TRIGGER-FISH, one of the fishes of the plectognath family, *Balistidæ,* in which when the dorsal fin is erected the first ray, which is very thick and strong, holds its elevated position so firmly that it cannot be pressed down; but if the second ray be depressed the first immediately falls down like the hammer of a gun when the trigger is pulled. The 8 or 10 genera and about 100 species are all inhabitants of warm seas. A single species (*B. carolinensis*) of the typical genus *Balistes* occasionally wanders northward on the Atlantic Coast as far as Cape Cod. It is a rather handsome fish, with the body enclosed in a heavy armor of scales and has three stout dorsal spines. The fool-fishes or file-fishes (q.v.), so called on account of their large, expressionless, staring eyes and rough prickly skins, are closely related. In West Indian waters are many representatives of these and other genera and especially of Balistes.

TRIGGS, Oscar Lovell, American educator: b. Greenwood, Ill., 2 Oct. 1865. He was graduated from the University of Minnesota in 1889, studied at the universities of Oxford and Berlin in 1890 and was teacher of English in the University of Chicago 1892-1903. He was editor of Lydgate's 'Assembly of Gods' (1895); coeditor of 'Complete Works of Walt

Whitman' (10 vols., 1902), etc., and has written 'Browning and Whitman; a Study in Democracy' (1893); 'Chapters in the History of the Arts and Crafts Movement' (1903), etc.

TRIGLIDÆ, a family of *acanthopterygian* fishes, deriving its name from *Trigla,* its typical genus, and related to the *Cottidæ.* This family is noted for having cheeks covered with bony plates and the head armed with spines and for membranous appendages; the eyes are set high in the head; one of the suborbitals is very large; the jaw is protracted; there are two dorsal fins, the rays of the first spinous; the first rays of the other fins, except the caudal, are often of the same structure, while all the fins are greatly developed. The family may be divided into six sub-families: (1) *Genus Dactyloptera,* in the species of which genus the pectoral fins are of sufficient length to enable the fish to support itself in the air for a short time. There are two species, *D. volitans* and *D. orientalis;* (2) *Genus Trigla,* typified by *T. cuculus, T. hirundo, T. lyra, T. gurnadus,* the American species, *Prinotus Carolinus, P. tribulus, P. punctatus,* etc.; (3) *Genus Cottuso* including *C. gobio, C. scorpius, C. bubalis, C. quadricornis, C. Virginianus, C. ænus, C. Mitchillii,* etc.; (4) *Genus Aspidophorus,* to which belongs the armed bull-head, *A. Europæus,* noted for being completely covered with horny scales; (5) *Genus Sebastes,* the spines of its main specie, *S. Norvegicus,* being used in Greenland for needles; (6) *Genus Gasterosteus,* which includes the *Sticklebacks,* the most prominent of which are *G. trachurus, G. spinachia, G. biaculeatus, G. neoboracencis, G. quadracus* and *G. occidentalis.*

TRIGLYPH, *in architecture,* ornaments repeated at equal intervals in the Doric frieze. Each triglyph consists of two entire gutters or channels cut to a right angle, called glyphs, and separated by their interstices, called femora, from each other, as well as from two other half-channels that are formed at the sides.

TRIGONIA (from a Greek word meaning "triangular"), is one of the most important types of the lamellibranchs in the Mesozoic seas. The trizoma became most abundant in the middle and upper Jura and the middle Cretaceous but has declined until it now is represented by but five species living in Australian waters. Consult Lycett, John, 'A Monograph of the British Fossil Trigonias' (London 1872–79).

TRIGONOMETRY, invented to meet the needs of astronomy, was for centuries (see TRIGONOMETRY, HISTORY OF THE ELEMENTS OF) but a useful art. At length it was advanced, chiefly by the Swiss mathematician, Leonard Euler, to the dignity of a science. At present, as both an art and a science, it has most intimate connections with nearly every branch of mathematics pure and applied. The aim of this article is to give briefly an intelligible account of the subject with some regard to both its practical and its theoretic aspects.

PLANE TRIGONOMETRY.

Conventions and Definitions.— Any two perpendicular lines, as $X'OX$ and YOY', divide the unbounded plane into four congruent portions, called *quadrants,* which hang together about the *origin* O and of which XOY. YOX', $X'OY'$ and $Y'OX$, taken in order, are known respectively as the 1st, 2d, 3d and 4th.

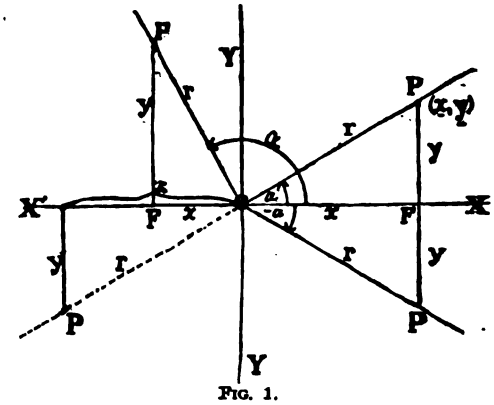

FIG. 1.

The *amount of turning* (about O and in the plane) of a half-line, as OX, which will bring it to coincide with another half-line, as OP, is called the *angle* between them. The angle is regarded *positive* or *negative* according as the turning is counter-clockwise or clockwise. If a half-line turn quite round, so as to coincide with its initial position, it is said to turn through or to generate a *whole,* or round, angle, or perigon. The *unit*-angle used in practical computation is the 360th part of the whole angle, and is named *degree.* The *unit*-angle employed in theoretic investigation is the angle generated by the turning of a half-line, as OP, till one of its points, as P, describes a circle arc equal in length to the segment OP. This unit-angle is named *radian,* being subtended by an arc equal to its radius. Either unit is readily expressible in terms of the other. Thus the whole angle, or 360°, being equal to 2π radians, where π is the ratio of the circumference to the diameter of a circle (see GEOMETRY, ELEMENTARY; GEOMETRY, PURE PROJECTIVE), it is seen that 1 radian = 57.3° (approximately), π radians = 180°, $\frac{\pi}{2} = 90°$, $\frac{\pi}{4} = 45°$, etc. From the definition of angle, it is clear that an angle may exceed 2π. Suppose, for example, that OX generates an angle α (Fig. 1) and then turns through 2π; it will thus have generated the angle $\alpha + 2\pi$. The half-lines bounding an angle are called its beginning and end. Except when otherwise stated or unmistakably implied, all angles will be thought as beginning at OX, *origin of angles.*

$X'OX$ and YOY' are named co-ordinate axes (see GEOMETRY, CARTESIAN); the former, the axis of *abscissæ,* or X-axis; the latter, the axis of ordinates, or Y-axis. Distances on or parallel to the X-axis are considered *positive* if measured *rightward, negative* if *leftward;* distances on or parallel to the Y-axis are *positive* if measured *upward, negative* if *downward.* Accordingly, to each point in the plane (Fig. 1) corresponds a unique pair of numbers, its abscissa and ordinate, its x and y, and conversely.

Definitions of the Trigonometric Functions.— On OP, making *any* angle α with OX, take *any* point P. Complete the figure as indi-

cated, denoting the lengths, of OF, FP and OP by x, y and r respectively. Plainly the values of x, y and r vary with the position of P on OP, but, and this is important, by the laws of similar triangles, their *ratios* do *not*. These ratios do vary, however, and this, too, is important to note, with the value or size of the angle α. Because of this reciprocal dependence of the ratios on α and of α on the ratios, the latter are called *functions* of α, and conversely. Because of their importance, the ratios, or trigonometric functions of the angle have received names and symbols, as follows:

$$\frac{y}{r} = \text{sine of } \alpha = \sin \alpha,$$

$$\frac{r}{y} = \text{cosecant of } \alpha = \operatorname{cosec} \alpha,$$

$$\frac{x}{r} = \text{cosine of } \alpha = \cos \alpha,$$

$$\frac{r}{x} = \text{secant of } \alpha = \sec \alpha,$$

$$\frac{y}{x} = \text{tangent of } \alpha = \tan \alpha,$$

$$\frac{x}{y} = \text{cotangent of } \alpha = \cot \alpha.$$

These equations serve to define sin α and cos α for *all* finite values of α. For any one of the other functions the denominator of the defining ratio becomes zero for certain values of α. Division by zero, being meaningless, is inadmissible. For such values of α, therefore, these functions are not defined. Thus, e.g., the tan is not defined for $\alpha = 90°$. It is indeed customary to write $\tan 90° = \infty$, but this is merely short for saying that, as α approaches 90°, tan α increases beyond every assignable (finite) value.

Range of Variation and Periodicity.— It is readily seen that, if α (Fig. 1) increase or decrease by 2π, then x, y and r regain their initial values. Hence $\sin(\alpha + 2n\pi) = \sin \alpha$, n being any positive or negative integer. Similarly for the other functions. Hence the functions are *periodic*, having the period 2π. It is to be noted, however, that an increase or decrease of α by π alone merely reverses x and y in sign, their ratios remaining the same. Accordingly the period of tan and cot is π. The periodicity of the trigonometric functions, it is, that gives them their great value in Analysis. Each function assumes all the values of its range as α varies through the period of the function. As α varies continuously from 0 to 2π, sin α changes continuously, increasing from 0 for $\alpha = 0$ to 1 for $\alpha = \frac{\pi}{2}$, then decreasing to 0 for $\alpha = \pi$, then changing sign and decreasing (algebraically) to -1 for $\alpha = \frac{3\pi}{2}$ then increasing to 0 for $\alpha = 2\pi$. Meanwhile cos α runs continuously through the same circuit of values, though in different order, beginning and ending with 1, and changing sign at $\alpha = \frac{\pi}{2}$ and $\frac{3\pi}{2}$. Hence sin and cos are restricted to the values 1, -1 and intermediate values. Not so the other functions, however. Both tan and cot assume *all* finite real values, and also vary continuously with α except for those angle values for which, as noted, the definitions fail. For any such value, the function is said to be discontinuous. For example, as α increases through 90°, tan α *leaps* from being great at will and positive to being great at will and negative. The sec and the cosec each assumes every finite real value except those between 1 and -1.

Geometric Depiction.— The above indicated courses of variation of the trigonometric functions may be readily represented graphically, namely, by the so-called curves of sine, cosine, tangent, etc. These are found by the familiar method of analytical geometry (see GEOMETRY, CARTESIAN) for plotting the graph of a function of a real variable. A convenient unit of length is chosen to represent the radian, or unit-angle. Angle values are then laid off on the

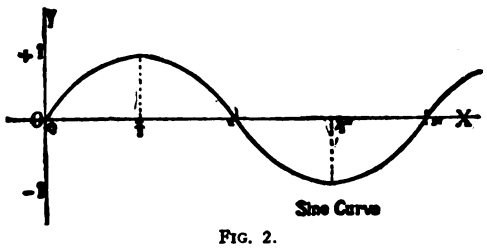

FIG. 2.

X-axis and corresponding function values parallel to the axis of Y. A sufficient number of points being thus determined, a smooth curve, called the graph of the function, is drawn through them. The curve in Fig. 2 is part of the sine curve, or sinusoid. The undulations extend rightward and leftward (for negative angles) indefinitely. The curve of cosines is identical in form with the sinusoid and may be obtained in position from the latter by translating it as a rigid figure leftward through $\frac{\pi}{2}$ units of length. For graphs of the remaining functions, the reader is referred to recent textbooks of trigonometry and analytical geometry. All the graphs in question are *transcendental* curves (see CURVES, HIGHER PLANE; CALCULUS), being intersected by any straight line of the plane in an infinite set of points, real or imaginary.

Functions of Negative Angles.— By reference to Fig. 1 and their definitions, it is immediately seen that the functions of α and the corresponding functions of $-\alpha$ are equal in value but excepting cos and sec, reversed in sign. Thus, symbolically, $\sin \alpha = -\sin(-\alpha)$, $\cos \alpha = \cos(-\alpha)$. Accordingly, cos and sec are called *even*, while the others are called *odd*, functions of the angle, in obvious analogy with the behavior of signs in case of powers of positive and negative quantities.

Complements, Supplements, Explements. —Two angles are called explements, supplements or complements, of each other, according as their sum is 2π, π or $\frac{\pi}{2}$. Any pair of explements are representable by the symbols $\pi + \alpha$ and $\pi - \alpha$; any two supplements by $\frac{\pi}{2} + \alpha$ and $\frac{\pi}{2} - \alpha$; any two complements by $\frac{\pi}{4} + \alpha$ and $\frac{\pi}{4} - \alpha$. The query is natural: how are the values of a function of two explements, or two

supplements, or two complements, related? By reference to Fig. 3, it is plain that $\sin(\pi+\alpha) = -\sin(\pi-\alpha)$ and that $\cos(\pi+\alpha) = \cos(\pi-\alpha)$, since $y=-y'$, $x=x'$ and $r=r'$; hence: *sines of explements are equal in value and opposite in sign; cosines of explements are equal.* In like manner may be detected all the relationships in question, tabulated below:

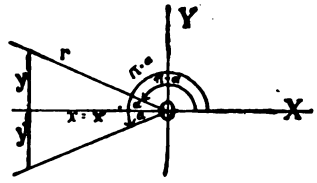

FIG. 3.

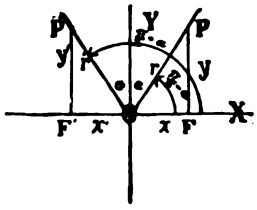

FIG. 4.

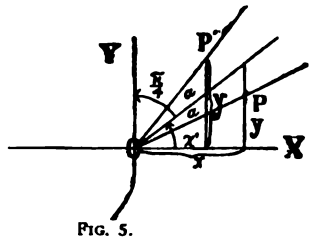

FIG. 5.

Explements, Fig. 3.

$$\begin{aligned}
\sin(\pi+\alpha) &= -\sin(\pi-\alpha),\\
\cos(\pi+\alpha) &= \cos(\pi-\alpha),\\
\tan(\pi+\alpha) &= -\tan(\pi-\alpha),\\
\cot(\pi+\alpha) &= -\cot(\pi-\alpha),\\
\sec(\pi+\alpha) &= \sec(\pi-\alpha),\\
\operatorname{cosec}(\pi+\alpha) &= -\operatorname{cosec}(\pi-\alpha);
\end{aligned}$$

Supplements, Fig. 4.

$$\begin{aligned}
\sin\left(\tfrac{\pi}{2}+\alpha\right) &= \sin\left(\tfrac{\pi}{2}-\alpha\right),\\
\cos\left(\tfrac{\pi}{2}+\alpha\right) &= -\cos\left(\tfrac{\pi}{2}-\alpha\right),\\
\tan\left(\tfrac{\pi}{2}+\alpha\right) &= -\tan\left(\tfrac{\pi}{2}-\alpha\right),\\
\cot\left(\tfrac{\pi}{2}+\alpha\right) &= -\cot\left(\tfrac{\pi}{2}-\alpha\right),\\
\sec\left(\tfrac{\pi}{2}+\alpha\right) &= -\sec\left(\tfrac{\pi}{2}-\alpha\right),\\
\operatorname{cosec}\left(\tfrac{\pi}{2}+\alpha\right) &= \operatorname{cosec}\left(\tfrac{\pi}{2}-\alpha\right);
\end{aligned}$$

Complements, Fig. 5.

$$\begin{aligned}
\sin\left(\tfrac{\pi}{4}+\alpha\right) &= \cos\left(\tfrac{\pi}{4}-\alpha\right),\\
\cos\left(\tfrac{\pi}{4}+\alpha\right) &= \sin\left(\tfrac{\pi}{4}-\alpha\right),\\
\tan\left(\tfrac{\pi}{4}+\alpha\right) &= \cot\left(\tfrac{\pi}{4}-\alpha\right),\\
\cot\left(\tfrac{\pi}{4}+\alpha\right) &= \tan\left(\tfrac{\pi}{4}-\alpha\right),\\
\sec\left(\tfrac{\pi}{4}+\alpha\right) &= \operatorname{cosec}\left(\tfrac{\pi}{4}-\alpha\right),\\
\operatorname{cosec}\left(\tfrac{\pi}{4}+\alpha\right) &= \sec\left(\tfrac{\pi}{4}-\alpha\right).
\end{aligned}$$

Note that in Fig. 4, $r=r'$, $y=y'$, $x=-x'$; that in Fig. 5, $OP=OP'=r=r'$, and that, from the laws of equality among triangles, $x=y'$, $x'=y$. Note, too, that in any of the tables, the sine and cosine relations determine the others, as should be so, since tan and cot are the *ratios*, while cosec and sec are respectively the *reciprocals*, of sin and cos. The mentioned determination is but a special manifestation of the

Interdependence of the Functions.— There is in trigonometry only a single fundamental or characteristic notion, as, say, that of sine — a fact that accounts for the proverbial high degree of plasticity or malleability of the subject matter. Any one of the six functions is derivable from, and expressible in terms of, each of the others. Of such interdependence the definitions themselves of the functions afford illustration. At the same time they furnish the clue to its explicit determination. Thus, squaring and adding corresponding members of the defining equations of sin and cos, and noting that $x^2+y^2=r^2$, one finds the fundamental relation: $\sin^2\alpha + \cos^2\alpha = 1$, whence $\sin\alpha = \pm\sqrt{1-\cos^2\alpha}$, and $\cos\alpha = \pm\sqrt{1-\sin^2\alpha}$; from which, if either $\sin\alpha$ or $\cos\alpha$ be known, the other may be found. In any of the better recent textbooks of trigonometry may be found a readily constructible table expressing each function in terms of each of the remaining ones. The theory of the six trigonometric functions is ultimately the doctrine of a single one of them.

A Table of Critical Values. — Certain critical values of the angle occur so frequently alike in theory and in practice that it seems desirable to tabulate the corresponding function values. The latter may be readily found from the function definitions by help of Fig. 1 and the three accompanying tables. Other angle values of notably frequent occurrence are 30°, or $\frac{\pi}{6}$, and 60°, or $\frac{\pi}{3}$. To find the value of sin 30°, observe, Fig. 1, that, if $\alpha=30°$, y is the half-chord of 60°, i.e., $y=\frac{r}{2}$; whence $\sin 30°=\frac{1}{2}$. From this, by means of the relation, $\cos\alpha=\sqrt{1-\sin^2\alpha}$, it is seen that $\cos 30°=\frac{1}{2}\sqrt{3}$; from this last, since $\cos\left(\frac{\pi}{4}+\alpha\right)\sin=\left(\frac{\pi}{4}-\alpha\right)$, $\sin 60°=\frac{1}{2}\sqrt{3}$; and, similarly, $\sin 30°=\frac{1}{2}$. Thence, by definitions and foregoing formulæ, $\tan 30°=\cot 60°=\frac{1}{\sqrt{3}}$, $\tan 60°=\cot 30°\sqrt{3}$; $\sec 30°=\operatorname{coseco} 60°=\frac{2}{\sqrt{3}}$, $\sec 60°=\operatorname{coseco} 30°=2$. Analogously and by means of relationships to be subsequently given,

$\alpha=$	0	$\frac{\pi}{4}$	$\frac{\pi}{2}$	$\frac{3\pi}{4}$	π	$\frac{5\pi}{4}$	$\frac{3\pi}{2}$	$\frac{7\pi}{4}$	2π	$\frac{9\pi}{4}$
$\sin=$	0	$+\frac{1}{2}\sqrt{2}$	1	$+\frac{1}{2}\sqrt{2}$	0	$-\frac{1}{2}\sqrt{2}$	-1	$-\frac{1}{2}\sqrt{2}$	0	
$\cos=$	1	$+\frac{1}{2}\sqrt{2}$	0	$-\frac{1}{2}\sqrt{2}$	-1	$-\frac{1}{2}\sqrt{2}$	0	$+\frac{1}{2}\sqrt{2}$	1	$\frac{\pi}{4}$
$\sec=$	1	$+\sqrt{2}$	∞	$-\sqrt{2}$	-1	$-\sqrt{2}$	∞	$+\sqrt{2}$	1	for
$\operatorname{cosec}=$	∞	$+\sqrt{2}$	1	$+\sqrt{2}$	∞	$-\sqrt{2}$	-1	$-\sqrt{2}$	∞	as
$\tan=$	0	1	∞	-1	0	1	∞	-1	0	Same
$\cot=$	∞	1	0	-1	∞	1	0	-1	∞	

function values corresponding to many other angles, as well as solutions of the inverse problem, admit of explicit determination. Such methods are, however, in general, inconvenient, and, in problems of computation, the determinations in question are, as a rule, effected by means of logarithmic tables. See ALEGBRA, and below.

The Laws of Sine, Cosine and Tangent.— Such may be named the three famous formulæ, now to be presented, that serve for the solution of any triangle, i.e., for the explicit determination of the remaining parts of a triangle of which any three independent parts are known.

By reference to Fig. 6, it is seen that $\sin \alpha = \frac{a}{2r}$;

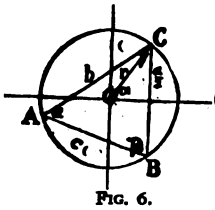

FIG. 6.

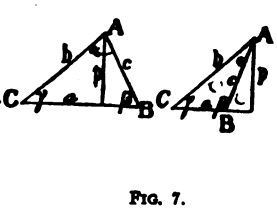

FIG. 7.

similarly, $\sin \beta = \frac{b}{2r}$ and $\sin \gamma = \frac{c}{2r}$; whence, for any triangle of sides a, b, c, and angles α, β, γ, there holds the relation: $\frac{a}{\sin \alpha} = \frac{b}{\sin \beta} = \frac{c}{\sin \gamma} = 2r$, r being the radius of the circumscribed circle. This relation is the LAW OF SINES. It is plain, Fig. 7, that $a = b \cos \gamma + c \cos \beta$, whence $c \cos \beta = a - b \cos \gamma$; squaring, $c^2 \cos^2 \beta = a^2 + b^2 \cos^2 \gamma - 2ab \cos \gamma$; by law of sines, $c \sin \beta = b \sin \gamma$; squaring this, adding to the preceding equations, and noting that $\sin^2 + \cos^2 = 1$, there results $c^2 = a^2 + b^2 - 2ab \cos \gamma$. This and the analogous equations, $b^2 = c^2 + a^2 - 2ca \cos \beta$, $a^2 = b^2 + c^2 - 2bc \cos \alpha$, similarly obtainable, together constitute the LAW OF COSINES. The LAW OF TANGENTS, deduced at a later stage of this article, is, $a + b : a - b = \tan \frac{1}{2}(\alpha + \beta) : \tan \frac{1}{2}(\alpha - \beta)$, where a and b are any two sides of any triangle, and α and β are the opposite corresponding angles.

Addition Theorems.— These serve to express functions of an angle in terms of the like or unlike functions of its parts. Let $OP = OP' = r = r'$ in Fig. 8; α' and α any two angles.

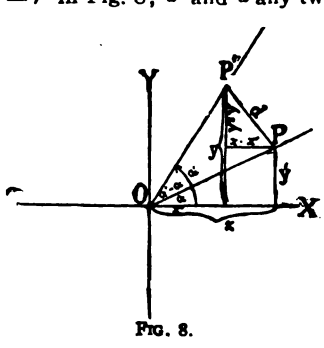

FIG. 8.

It is evident that $x = r \cos \alpha$, $x' = r \cos \alpha'$, $y = r \sin \alpha$, $y' = r \sin \alpha'$. Also, by the Pythagorean theorem and the law of cosines, $d^2 = (x - x')^2 + (y - y')^2 = 2r^2 - 2r^2 \cos (\alpha' - \alpha)$, whence, on substituting $r \cos \alpha$, etc., and reducing, it is sound that $\cos (\alpha' - \alpha) = \cos \alpha' \cos \alpha + \sin \alpha' \sin \alpha$. The four formulæ

(1) $\cos (\alpha - \beta) = \cos \alpha \cos \beta + \sin \alpha \sin \beta$.
(2) $\cos (\alpha + \beta) = \cos \alpha \cos \beta - \sin \alpha \sin \beta$.
(3) $\sin (\alpha + \beta) = \sin \alpha \cos \beta + \cos \alpha \sin \beta$.
(4) $\sin (\alpha - \beta) = \sin \alpha \cos \beta - \cos \alpha \sin \beta$,

are together named the *Addition Theorem for Sine and Cosine*. Formula (1) is equivalent to the preceding one; (2) results from (1) on replacing $-\beta$ for β; (3) from (1) on writing $\frac{\pi}{2} - \alpha$ for α; and (4) from (3), as (2) from (1). Dividing (4) by (1), and both terms of the resulting right-hand quotient by $\cos \alpha \cos \beta$, there results: $\tan (\alpha - \beta) = (\tan \alpha - \tan \beta) : (1 + \tan \alpha \tan \beta)$, which with the relation, $\tan (\alpha + \beta) = (\tan \alpha + \tan \beta) : (1 - \tan \alpha \tan \beta)$, constitutes the *Addition Theorem for the Tangent*. The analogous relations for the remaining functions are omitted as being but little used.

Prosthapheretic Formulæ.— From the addition theorems, which concern functions of *angle* sums and differences, may be easily deduced equally important formulæ concerning *function* sums and differences. Replacing $\alpha + \beta$ by u and $\alpha - \beta$ by v in (1), (2), (3), (4), adding (3) and (4), then (1) and (2), and then adding or subtracting one obtains the four formulæ:

(5) $\sin u + \sin v = 2 \sin \frac{1}{2}(u + v) \cos \frac{1}{2}(u - v)$,
(6) $\cos u + \cos v = 2 \cos \frac{1}{2}(u + v) \cos \frac{1}{2}(u - v)$.
(7) $\sin u - \sin v = 2 \cos \frac{1}{2}(u + v) \sin \frac{1}{2}(u - v)$,
(8) $\cos u - \cos v = -2 \sin \frac{1}{2}(u + v) \sin \frac{1}{2}(u - v)$.

These relations, which have been named *prosthapheretic*,* express sums and differences in terms of products, and so render them suitable for logarithmic computation.

Some Important Deductions from Foregoing Formulæ.—Setting $\alpha - \beta$ in (2) and (3), there result

(9) $\cos 2\alpha = \cos^2 \alpha - \sin^2 \alpha$,
(10) $\sin 2\alpha = 2 \sin \alpha \cos \alpha$.

The former combined with the relation $1 = \sin^2 \alpha + \cos^2 \alpha$ yields

(11) $1 + \cos 2\alpha = 2 \cos^2 \alpha$,
(12) $1 - \cos 2\alpha = 2 \sin^2 \alpha$.

Again, putting $\alpha = \beta$ in addition theorem of tangent, the result is $\tan 2\alpha = 2 \tan \alpha : (1 - \tan^2 \alpha)$. Division of (12) by (11) yields $(1 - \cos 2\alpha) : (1 + \cos 2\alpha) = \tan^2 \alpha$, whence follow

(13) $\cos 2\alpha = \frac{1 - \tan^2 \alpha}{1 + \tan^2 \alpha}$,

(14) $\sin 2\alpha = \frac{2 \tan \alpha}{1 + \tan^2 \alpha}$.

Once more by definition $\tan \alpha = \sin \alpha : \cos \alpha$. Squaring each member and adding 1 to each square, one finds the most used of secant formulæ, $\sec^2 \alpha = 1 + \tan^2 \alpha$. The corresponding cosecant relation is $\operatorname{cosec}^2 \alpha = 1 + \cot^2 \alpha$. Hosts of other more or less useful and interesting kindred formulæ, readily deducible, may be found in the current textbooks and in pocket manuals for engineers. This paragraph will be closed with a deduction of the above presented Law of Tangents. By the Law of Sines, $a : b = \sin \alpha : \sin \beta$; whence, by "composition and division,"

* So called by Prof. W. B. Smith. *Prosthaphæresis* was a method of computation invented by Wittig, a pupil of Tycho Brahe. The method has been superseded by logarithms.

$(a+b):(a-b) = (\sin\alpha + \sin\beta):(\sin\alpha - \sin\beta)$; expanding the right-hand number by (4) and (3), and applying the definition of tangent, the relation sought is found to be $(a+b):(a-b) = \tan\frac{1}{2}(\alpha+\beta):(\tan\frac{1}{2}(\alpha-\beta)$.

Solution of Triangles.— Etymologically trigonometry is *triangle measurement*, and, though the science wonderfully exceeds the verbal significance of its name, yet measurement of triangles is a very important, and, at the same time, the most generally familiar, one of its manifold applications. A triangle is determined by *three independent data*, of which the simplest are: two sides and an angle; two angles and a side; three sides. The three angles are *not independent*, any pair of them determine the third angle. Let a, b, c denote the lengths of the sides, and α, β, γ the corresponding (opposite) angles, of any triangle. The data being those mentioned, three cases arise: (i) given a *pair* of *opposite* parts, and one other, as a, α and b, or a, α and β, to find the remaining parts; (ii) given three *adjacent* parts, as a, γ, and c, or a, c and β, to find the rest; (iii) given three *alternate* parts, a, b and c, to find the angles. In case (i), it is sufficient to employ the Law of Sines; in (ii), the Law of Tangents; in (iii), the Law of Cosines. In (i), if the "one other" part be a side, as b, the Sine Law yields the sine of β, the opposite angle. But, as $\sin\beta = \sin(\pi-\beta)$, the problem presents an ambiguity, which, in every actual example, is readily resoluble by easy considerations explained in every text book of trigonometry. The Cosine Law is equivalent to the equation: $\cos\alpha = (b^2+c^2-a^2):2bc$. The numerator not being a product, the formula is not adapted to logarithmic use. From it, however, is readily derived an adequate formula which is so adapted. It is

$$(15)\quad \tan\tfrac{1}{2}\alpha = \frac{1}{s-a}\sqrt{\frac{(s-a)(s-b)(s-c)}{s}},$$

where s is $\frac{1}{2}(a+b+c)$. Similar relations hold for β and γ. The significance of (15) and its elements is further exhibited by Fig.

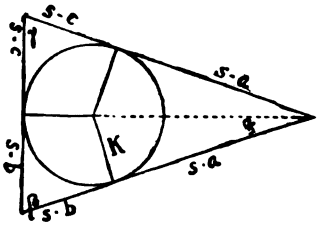

FIG. 9.

9, any triangle and its inscribed circle. The radius K is precisely equal to the radical of (15), whence, if T denote the *area* of the triangle, $T = sK = \sqrt{s(s-a)(s-b)(s-c)}$, a formula attributed to Hero of Alexandria (about 125 B.C.).

Triangle Solution Exemplified.—Given $a = 32.456$, $b = 41.724$, $c = 53.987$; required the angles. Applying logarithms to (15),

$$\log\tan\tfrac{1}{2}\alpha = \log K - \log(s-a).$$

$s = 64.084$, $(s-a) = 31.628$,
$(s-b) = 22.36$, $(s-c) = 10.097$,
$\log(s-a) = 1.50007$, $\log(s-b) = 1.34947$,
$\log(s-c) = 1.00419$, $\operatorname{colog} s = 8.19325 - 10$.

Summing and taking half,

$\log K = 1.02349$; $\log(s-a) = 1.50007$;

whence

$$\log\tan\tfrac{1}{2}\alpha = 9.52342 - 10,$$

whence

$\frac{1}{2}\alpha = 18°\ 27'\ 23''$, $= 36°\ 54'\ 46''$.

In like manner one may find $\beta = 50°\ 32'\ 32''$. and $\gamma = 92°\ 32'\ 44''$. As a *check* one finds $\alpha+\beta+\gamma = 180°\ 0'\ 2''$, an excess regarded in practice as very slight and in most work negligible. To secure more accurate results, which is seldom necessary, it suffices to employ logarithms of more than five decimal places.

Inverse Trigonometric Functions.— The symbols $\arcsin n$ or $\sin^{-1} n$, $\arccos n$ or $\cos^{-1} n$, $\arctan n$ or $\tan^{-1} n$, etc., denote respectively an *angle* whose sine is n, whose cosine is n, etc. They are variously read *inverse* sine, cosine, etc., of n, or *anti-sine*, etc., of n, or, again the *arc* or *angle* whose sine, cosine, etc., is n. They are called *inverse* trigonometric or circular functions, being related to the direct (so-called) trigonometric or circular functions much as are the integral and the derivative of the Calculus (which see), or the logarithm and the exponential of Algebra (which see). Like analogies abound. It should be noted that $\sin^{-1}$, $\cos^{-1}$, etc., do *not* signify reciprocal of sin, cos, etc. Moreover, unless the contrary is expressed, it is generally understood that $\sin^{-1} n$, etc., shall signify the *smallest* positive one of the infinitely many angles whose sine, etc., is n. Thus $\sin^{-1}\frac{1}{2}$ will ordinarily mean 30°, though, taken in full generality, it would signify $30° \pm 2n\pi$, or $150° \pm 2n\pi$, n being any integer. The direct functions are one-valued functions of the angle, but the angle is an infinitely many-valued function of a direct-function value.

Trigonometric Equations.— These are such as involve one or more direct or inverse trigonometric functions regarded as the unknowns or variables like the x, y, etc., of ordinary algebra. Such an equation, for example, is $\sin\alpha + \sin 5\alpha = \sin 3\alpha$. To solve it, apply formula (5); then $2\sin 3\alpha\cos 2\alpha = \sin 3\alpha$; whence either $\sin 3\alpha = 0$, or $2\cos 2\alpha = 1$; hence either $\alpha = n\pi : 3$ or $\alpha = n\pi \pm \pi : 6$. For another example let $\sin^{-1}\frac{3}{5} - \cos^{-1}\frac{12}{13} = \sin^{-1} x$, to find x. Denote $\sin^{-1}\frac{3}{5}$, $\cos^{-1}\frac{12}{13}$, and $\sin^{-1} x$ by α, β, and γ respectively. Then $\sin\alpha = \frac{3}{5}$, $\cos\alpha = \frac{4}{5}$, $\cos\beta = \frac{12}{13}$, $\sin\beta = \frac{5}{13}$, $\sin\gamma = x$. Also $\alpha - \beta = \gamma$, and $\sin(\alpha-\beta) = \sin\alpha\cos\beta - \cos\alpha\sin\beta = \sin\gamma = x$; substituting the values of $\sin\alpha$, etc., it is found that $x = \frac{16}{65}$. For applications to the solution of the general cubic equation in one unknown, the reader is referred to the articles on ALGEBRA or that on EQUATIONS, GENERAL THEORY OF.

Some Trigonometric Series.— Consider the infinite series

$$(s)\quad \sin\alpha = \alpha - \frac{\alpha^3}{1\cdot2\cdot3} + \frac{\alpha^5}{1\cdot2\cdot3\cdot4\cdot5} - \frac{\alpha^7}{1\cdot2\cdot\ldots\cdot7} + \ldots,$$

$$(c)\quad \cos\alpha = 1 - \frac{\alpha^2}{1\cdot2} + \frac{\alpha^4}{1\cdot2\cdot3\cdot4} - \frac{\alpha^6}{1\cdot2\cdot\ldots\cdot8} + \ldots.$$

It may be proved algebraically, and is proved by means of Maclaurin's Expansion (see CALCULUS), that the series (s) and (c) respectively represent or define $\sin\alpha$ and $\cos\alpha$ for every *finite* value of the angle α reckoned in terms of

the radian. The precise meaning is that, if S_n denote the sum of the first n terms of (s), then the *limit* of S_n as n increases endlessly is $\sin a$. Similarly for (c). The algebraic proof is too long for insertion here, and that by the Calculus rests on presuppositions not appropriate in this article. As a compromise it is edifying and interesting to *assume* the validity of equations (s) and (c) and then after the manner of natural science to test them, regarded as hypotheses, by their implications, or consequences. Rigorous proof is not thus obtainable, but certainty can be thus more and more nearly approximated. Any consequence of (s) or (c) or both that is known to be untrue would alone suffice to invalidate one or both assumptions absolutely, while any number of consequences known to be true merely *tend* to support but do not suffice to prove the hypotheses. Some such supporting consequences may be noted. If $a = 0$, series (s) and (c) become respectively 0 and 1, as should be the case, since $\sin 0 = 0$ and $\cos 0 = 1$. If a be replaced by $-a$, each term of (s) is reversed in sign, while (c) is unchanged; and this, too, should be so, for, as before seen, the sin is an *odd*, and the cos an *even*, function of the angle. Again, it is proved in algebra (see ALGEBRA, also SERIES) that, e being the Napierian base.

$$e^a = 1 + a + \frac{a^2}{1\cdot 2} + \frac{a^3}{1\cdot 2\cdot 3} + \ldots \text{ad inf.}$$

for every finite value of a real or imaginary. Writing ia for a, where (after Euler) $i = \sqrt{-1}$, one obtains

$$e^{ia} = \left(1 - \frac{a^2}{1\cdot 2} + \frac{a^4}{1\cdot 2\cdot 3\cdot 4} - \ldots\right) + i\left(a - \frac{a^3}{1\cdot 2\cdot 3} + \frac{a^5}{1\cdot 2\cdot 3\cdot 4\cdot 5} - \ldots\right),$$

or $$e^{ia} = \cos a + i \sin a.$$

Replacing i by $-i$,

$$e^{-ia} = \cos a - i \sin a.$$

The product of the last two equations yields $1 = \cos^2 a + \sin^2 a$, another result known to be true. Once more,

$$e^{i\alpha}\cdot e^{i\beta} = e^{i(\alpha+\beta)} = \cos(\alpha+\beta) + i\sin(\alpha+\beta);$$

also,

$$e^{i\alpha}\cdot e^{i\beta} = (\cos\alpha + i\sin\alpha)(\cos\beta + i\sin\beta)$$
$$= \cos\alpha\cos\beta - \sin\alpha\sin\beta + i(\sin\alpha\cos\beta + \cos\alpha\sin\beta);$$

whence

$$\cos(\alpha+\beta) = \cos\alpha\cos\beta - \sin\alpha\sin\beta,$$

and

$$\sin(\alpha+\beta) = \sin\alpha\cos\beta + \cos\alpha\sin\beta,$$

two equations of the known addition theorem for sine and cosine. It is indeed a fact that the whole body of trigonometric relations deduced or deducible from the original definitions, Fig. 1, of the functions, are obtainable analytically from (s) and (c) regarded as definitions, and, like the latter, would then be free from geometric reference. Each of the other functions, direct or inverse, is representable in the form of a series analogous to (s) and (c). Such series may be found in books of trigonometry and of the calculus.

DeMoivre's Theorem.—From $e^{ia} = \cos\alpha + i\sin\alpha$ it follows that

$$e^{in\alpha} = (\cos\alpha + i\sin\alpha)^n;$$

but $$e^{in\alpha} = \cos n\alpha + i\sin n\alpha,$$

hence $$(\cos\alpha + i\sin\alpha)^n = \cos n\alpha + i\sin n\alpha,$$

a famous theorem due to De Moivre and known as De Moivre's Theorem. Suppose $n = 3$, then

$$\cos 3a + i\sin 3a = (\cos a + i\sin a)^3 = \cos^3 a - 3\cos a\sin^2 a + i(3\cos^2 a\sin a - \sin^3 a);$$

whence $$\cos 3a = \cos^3 a - 3\cos a\sin^2 a,$$
$$\sin 3a = 3\cos^2 a\sin a - \sin^3 a.$$

Similarly sines and cosines of *any multiple* of a may be expressed in terms of the like functions of the single angle.

Euler's Formulæ.— From the relations $e^{ia} = \cos a + i\sin a$, $e^{-ia} = \cos a - i\sin a$, may be found, by addition and subtraction, the Eulerian equations

$$\cos a = \frac{1}{2}(e^{ia} + e^{-ia}), \quad \sin a = \frac{1}{2i}(e^{ia} - e^{-ia}),$$

which are equivalent to (c) and (s) and serve to define sin and cos in terms of imaginary powers of the Napierian base.

Some Curious Relations.— Letting $a = \frac{\pi}{2}$ $e^{ia} = \cos a + i\sin a$, we get $e^{i\pi i} = i$: squaring, we obtain $e^{i\pi} = -1$; also $e^{i^2\pi i} = -i$, and $e^{2\pi i} - 1 = 0$. The last is especially noteworthy as involving the most notable set of five numbers in mathematics: 0, 1, i, e, π. Further developments would lead into the doctrine of Circle Partition (*Kreistheilung*), which belongs to the Theory of Functions of the Complex Variable, to which the reader is referred. See COMPLEX VARIABLE, THEORY OF FUNCTIONS OF A.

SPHERICAL TRIGONOMETRY.

A spherical triangle is the figure bounded by three arcs (of great circles) on the surface of a sphere. Spherical trigonometry has for its principal problem that of determining the numerical values of the three remaining parts of a spherical triangle when three parts are given. This note is confined to triangles whose sides are each less than a semi-circumference and whose angles are each less than π, or 180°. Any spherical angle is measured by the corresponding diedral angle, and the latter by the plane angle of intersecting lines (in the faces of the diedral angle) drawn perpendicular to its edge. For convenience the triangle will be supposed to be on a sphere of *unit* radius; the sides will then be measured by their corresponding central angles. In all mathematics, every problem of angular measurement is ultimately that of measuring the angle between intersecting lines, as all distance problems are reducible to that of determining the distance between two points.

The Right Spherical Triangle.— Let O be the centre of the unit-sphere containing the triangle CAB right-angled at A. BP being drawn

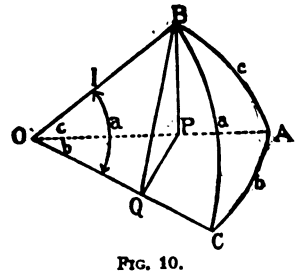

FIG. 10.

perpendicular to OA, and similarly PQ to OC, BQ is perpendicular to OC. By aid of the figure

one may readily find in order the relationships:

(1) $\cos a = \cos b \cos c$, (2) $\sin c = \sin a \sin C$,
(3) $\cos C = \cot a \tan b$ (4) $\sin b = \tan c \cot C$,
(5) $\sin b = \sin a \sin B$, (6) $\cos B = \cot a \tan c$,
(7) $\sin c = \tan b \cot B$, (8) $\cos a = \cot B \cot C$,
(9) $\cos B = \cos b \sin C$, (10) $\cos C = \cos c \sin B$.

Sufficient for the solution of any right triangle, these are less convenient than the equivalent derived set presented under the title

Napier's Circular Parts and Rules.— These parts are: $90° - a$, $90° - B$, $90° - C$, b and c. By substitution in the preceding formulæ, these parts are seen to be related as follows:

(1′) $\sin (90° - a) = \cos b \cos c$,
(2′) $\sin c = \cos (90° - a) \cos (90° - C)$,
(5′) $\sin b = \cos (90° - a) \cos (90° - B)$,
(9′) $\sin (90° - B) = \cos b \cos (90° - C)$,
(10′) $\sin (90° - C) = \cos c \cos (90° - B)$;
(8′) $\sin 90° - a) = \tan (90° - B) \tan (90° - C)$,
(7′) $\sin c = \tan b \tan (90° - B)$,
(4′) $\sin b = \tan c \tan (90° - C)$,
(6′) $\sin (90° - B) = \tan (90° - a) \tan c$,
(3′) $\sin (90° - C) = \tan (90° - a) \tan b$.

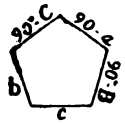

FIG. 11.

Arranging the parts in some such cyclical scheme as in Fig. 11, it will be seen that any part being taken as *middle* part, there are two *adjacent* parts, and two others that may be and are called *opposite*. By inspecting the first half of the preceding table it appears that the sine of any middle part is equal to the product of the cosines of its opposite parts, and, from the second half, that the sine of a middle part is the product of the tangents of its adjacent parts. Such are Napier's rules for circular parts, the more readily remembered by virtue of the assonances appearing in their statement.

In the solution of right spherical triangles it should be observed: (1) that a is less or greater than 90° according as 90° is not or is intermediate to b and c, these being supposed not equal to 90°; (2) b or c and the opposite angle are both less or both greater than 90°; (3) that corresponding to the data, b or c and the opposite angle, there are two solutions.

Quadrantal Triangles.—Those are so named that have a side equal to 90°. The supplemental polar triangle of a quadrantal is right-angled. Hence to solve a quadrantal, solve its polar and subtract its parts each from 180°.

Oblique Spherical Triangles.— The theory

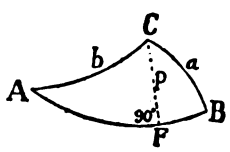

FIG. 12.

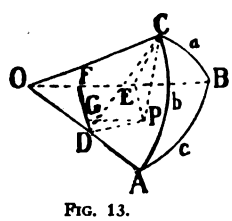

FIG. 13.

of the oblique spherical triangle is contained in the following numbered equations deducible by help of the figures. From Fig. 12 and analogy it is obvious that

(11) $\sin a : \sin b = \sin A : \sin B$,
(12) $\sin b : \sin c = \sin B : \sin C$,
(13) $\sin c : \sin a = \sin C : \sin A$,

three propositions constituting the *Law of Sines* for Spherical Trigonometry. The Law of Cosines, readily found from Fig. 13 (in which CP is perpendicular to the plane AOB, PD, and PE are perpendicular to OA and OB, and PG and DF are parallel to OF and PE), is the triplet:

(14) $\cos a = \cos b \cos c + \sin b \sin c \cos A$,
(15) $\cos b = \cos c \cos a + \sin c \sin a \cos B$,
(16) $\cos c = \cos a \cos b + \sin a \sin b \cos C$.

From these, by passing to the polar triangle (of equal generality with that of Fig. 13), one finds three relations of type

(17) $\cos A = \sin B \sin C \cos a - \cos B \cos C$.

From the law of cosines flow the two triplets of formulæ adapted to logarithmic computation and being respectively of the types

(18) $\tan \frac{1}{2}A = \sqrt{\sin(s-b)\sin(s-a) : \sin s(s-a)}$,

and

(19) $\tan \frac{1}{2}a = \sqrt{-\cos(S-A)\cos S : \cos(S-B)\cos(S-C)}$,

s and S being the *half* sums of the sides and of the angles.

Napier's Analogies.— From (17) by help of the Sine Law are found the so-called *first set* of Napier's analogies, namely

(20) $\cos \frac{1}{2}(a+b) : \cos \frac{1}{2}(a-b) = \cot \frac{1}{2}C : \tan \frac{1}{2}(A+B)$,
(21) $\sin \frac{1}{2}(a+b) : \sin \frac{1}{2}(a-b) = \cot \frac{1}{2}C : \tan \frac{1}{2}(A-B)$;

and from these, by use of the polar triangle, *this second set:*

(22) $\cos \frac{1}{2}(A+B) : \cos \frac{1}{2}(A-B) = \tan \frac{1}{2}c : \tan \frac{1}{2}(a+b)$.
(23) $\sin \frac{1}{2}(A+B) : \sin \frac{1}{2}(A-B) = \tan \frac{1}{2}c : \tan \frac{1}{2}(a+b)$.

For ways of resolving the ambiguity incident to the use of the Sine Law, the reader is referred to any standard work on Spherical Trigonometry. (See *Bibliography*).

Plane Trigonometry a Special Case of Spherical.— The ground of the notable resemblances between corresponding plane and spherical formulæ may be made evident by the following considerations: Suppose a plane p tangent to a sphere of radius r at a point P. If r increase without limit, the one-based zone having P for mid-point will flatten, swelling out toward p so as to include *any* given finite point Q near at will but not on p however far Q be from P. Plane p is said to be the *limit* of the *sphere surface* as r increases limitlessly — a relationship commonly expressed briefly by saying that a plane is a sphere of infinite radius. Accordingly the geometry and the trigonometry on a sphere of radius r ought to degrade respectively into plane geometry and plane trigonometry, on taking r infinitely great. To show that and how, in case of trigonometry, such degeneration actually occurs, consider the spherical Sine Law

(s) $$\frac{\sin a}{\sin \alpha} = \frac{\sin b}{\sin \beta} = \frac{\sin c}{\sin \gamma},$$

where a, b, c are the sides (i.e., the central angles they subtend), and α, β, γ the corresponding angles, of a triangle on a sphere of radius r. Denoting the *lengths* of a, b, c by l, m, n respectively, $a, b, c = \frac{l}{r}, \frac{m}{r}, \frac{n}{r}$ (radian measure). Denoting the *lengths* of a, b, c by l, m, n re-

$$\frac{\sin\frac{l}{r}}{\frac{l}{r}}\cdot\frac{l}{\sin\alpha} = \frac{\sin\frac{m}{r}}{\frac{m}{r}}\cdot\frac{m}{\sin\beta} = \frac{\sin\frac{n}{r}}{\frac{n}{r}}\cdot\frac{n}{\sin\gamma}.$$

Now it may be proved that the *limit of the ratio of the sine to the angle as the angle approaches zero is* 1. Hence as r increases limitlessly and consequently the angles $\frac{l}{r}, \frac{m}{r}, \frac{n}{r}$ (numerators being kept constant, or finite at any rate) approach zero, the foregoing Sine Law degrades into $\frac{l}{\sin\alpha} = \frac{m}{\sin\beta} = \frac{n}{\sin\beta}$, the Sine Law for *plane* triangles. Similarly, by use of the Sine and Cosine Series, it may be shown that the Cosine Law for the sphere degenerates for $r = \infty$ into the Cosine Law for the plane, and that the Tangent Law for the plane is but a special case of the fourth Napierian analogy, the Law of Tangents for the sphere.

Hyperbolic Functions.— These are associated with the rectangular hyperbola (see GEOMETRY, CARTESIAN and CALCULUS) in a manner similar to the connection of the trigonometric or circular functions with the circle. The hyperbolic functions invented by Lambert (1768), may be defined as follows (compare with the Eulerian formulæ): naming them *hyperbolic sine*, etc., and denoting them by *sinh*, etc., their definitions are, $\sinh a = \frac{1}{2}(e^a = e^{-a})$, $\cosh a = \frac{1}{2}(e^a + e^{-a})$, $\tanh a = \sinh a : \cosh a$, etc. Each of the six is expressible in terms of each of the others. Thus $\cosh^2 a - \sinh^2 a = 1$. $\tanh^2 a + \operatorname{sech}^2 a = 1$, etc. These functions are most instructively introduced through the integral calculus. For their geometric interpretation the reader is referred to such works as W. B. Smith's 'Infinitesimal Analysis,' Vol. I, and Greenhill's 'Differential and Integral Calculus.'

Pseudo-spherical Trigonometry.— A given sphere has constant positive *curvature* (see CALCULUS). If the radius be infinite, the curvature is *zero*. The plane is a sphere of constant zero curvature. Suppose the curvature to be constant and *negative*. The surface is then called *pseudo-sphere*. This, too, has its trigonometry. Its formulæ are obtainable from those of spherical trigonometry by replacing the circular functions by the corresponding hyperbolic functions. See TRIGONOMETRY, HISTORY OF THE ELEMENTS OF.

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TRIGONOMETRY, History of the Elements of. Among the ancients trigonometry was simply an adjunct to astronomy, and it so remained until comparatively recent times. A slight trace of its application to mensuration is found in the famous papyrus of Ahmes (see ALGEBRA, HISTORY OF THE ELEMENTS OF), where a quotient called *seqt* is mentioned. In the case of the pyramids the *seqt* seems to have been the cosine of the angle of slope of the edge, or in some cases the tangent of the angle of slope of the face. Among the Greeks frequent reference to trigonometry is found among the writings of the astronomers. Hypsicles (c. 190 B.C.) used the Babylonian division of the circumference into 360 degrees and from this time the sexagesimal fraction became common in astronomy. Hipparchus (c. 150 B.C.) was the first to compute a table of chords, the ancients generally using the chord instead of the half-chord or sine. Hero of Alexandria (see HERO OF ALEXANDRIA) gave rules which are the equivalent of certain modern formulas, and in particular computed the values of $\cot\frac{2\pi}{n}$ for all values of n from 3 to 12 inclusive. Menelaus of Alexandria (c. 100 A.D.) carried the study of Spherics to a considerable prominence, his celebrated *Regula sex quantitatum* relating to the transversal of the sides of a spherical triangle, and he wrote six books on the calculation of chords. It is, however, to Claude Ptolemy (q.v.), c. 125 A.D., that is due the introduction of a formal spherical trigonometry into astronomy. The *Almagest* made the sexagesimal fraction more widely known and Ptolemy calculated the chords of arcs to a half degree.

The Hindu astronomers used the half chord instead of the chord which the Greeks usually (but not always) employed. They thus used the sine, and they added the versed sine and the cosine, computing tables for these ratios. They also knew the relation, $\sin^2 x + \cos^2 x = 1$.

The Arabs made the greatest advance in trigonometry of any peoples before the Renaissance. Al Battani, or Albategnius as the Latin writers called him, c. 900 A.D., brought into greater prominence the use of the sine, and computed a table of values of $\sin x/\cos x$ and its reciprocal, thus practically using the tangent and cotangent. The present names for the various functions are mostly modern. The name *sinus* seems first to have been used by Gherardo of Cremona, c. 1150, although often attributed to Plato of Tivoli (also c. 1150) in his translation of Al Battani. Among the western Arabs, Jabir ibn Aflah, often known as Geber, was prominent, his trigonometry covering both the plane and the spherical parts.

In Christian Europe the science is first seriously considered in the work of Regiomontanus (q.v.), the famous pupil of Peuerbach (q.v). The latter had done some excellent work in trigonometry, but he died before he could write his projected treatise, and Regiomontanus carried out his plans. The result was a work which influenced subsequent textbooks much as Euclid's 'Elements' influenced plane geometry. The principal formulas of plane and spherical trigonometry are set forth and the elementary science became crystallized. Subsequent advances have been chiefly in the nomenclature, the symbolism and the computation of tables, particularly of logarithmic tables. Among the most prominent computers of the values of the functions and of logarithms should be mentioned Rhæticus (1514–76), Pitiscus (1561–

1613), Bürgi (1552–1632), Napier (1550–1617), Briggs (1560–1630) and Vlacq, whose tables appeared in 1628.

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TRIIODOMETHANE. See IODOFORM.

TRIKALA, tré'kä-lä, or **TRIKKALA,** Greece, city in northwestern Thessaly, 38 miles west of Larissa, with which it has railroad connection by way of the Gulf of Volos. The chief industries are tanning, dyeing and the manufacture of cotton and woolen goods. The ancient town, Trikka, had a famous temple of Æsculapius. Pop. 18,000.

TRIKOUPIS, trē-koo'pĭs, **Charilaos,** Greek statesman, son of Spiridon Trikoupis (q.v.): b. Nauplia, 23 July 1832; d. Cannes, France, 11 April 1896. He inherited his father's literary bent of mind and later began the study of jurisprudence in Athens, afterward studying and completing his course at Paris. His mind then turned toward diplomacy and in 1852 he entered the service of his country as attaché to the legation in London and in 1863 was promoted chargé-d'affaires. In 1865 he was in charge of the negotiations with England which brought about the cession of the Ionian Islands. He was elected to the Boulé the latter part of the same year and joining the Radical party became successively Minister of Foreign Affairs in 1866, Premier in 1875 an again in 1877 Minister of Foreign Affairs in the coalition ministry under Canaris. He then again became Premier in 1878–80 and served also the terms 1882–85, 1886–90, 1891–93 and 1893–95, but at the next election he was defeated and even lost his seat in the Boulé. This was probably due to the low state of the finances of the government, which he had in vain attempted to raise to a degree of stability through the imposition of tariffs and the enactment of agrarian laws as well as by the building of railways. Public confidence in his administrative ability was, however, once more shown by his re-election from the district of Valtos, but he was at the time sick and died before taking his seat. His speeches were published in one volume at Athens in 1888.

TRIKOUPIS, Spiridon, Greek statesman and man of letters: b. Missolonghi, 20 April 1788; d. Athens, 24 Feb. 1873. After completing his education at Paris and London he became private secretary to Lord Guilford at Corfu. In 1821, upon the outbreak of the Greek insurrection, he returned to Missolonghi and joined the patriots. Throughout much of his life he was engaged either in administrative or diplomatic affairs. From 1833–41 he was Minister to England and after 1843 he held in succession the portfolios of the Ministry of Foreign Affairs and of Public Instruction, the Vice-Presidency of the Senate, and the post of Envoy Extraordinary to France. As a man of letters he was among the greatest names of modern Greece. Most celebrated of his works was the oration pronounced on Lord Byron, his friend and associate, at the cathedral of Missolonghi. His 'Poeme des Kliphtes' (1820) is well known, as is also his 'Histoire de la Révolution Grecque' (1853–57).

TRILBY, a novel by George Du Maurier, so named for its principal figure and published in 1894. It is a story of artist life in the Latin Quarter of Paris. It achieved a great and sudden popularity and was very soon dramatized. Trilby, the heroine, is a laundress and artist's model and her relations with three artists, Taffy, the Laird and Little Billee, form the theme.

TRILITHON, or **TRILITH,** a monument, probably sepulchral, either standing alone or forming part of a larger work, and consisting of three stones, two uprights, connected by a continuous impost or architrave. Among the best-known examples of trilithons are those at Stonehenge, on Salisbury Plain, England. In the trilithons still standing, each of the uprights has a tenon on its surface and the under sides of the architrave or horizontal piece have each two mortises into which the tenons fit. Similar monuments are found in Scandinavia over the graves of the distinguished dead.

TRILL, *in music,* the repetition of a note alternately with another, either a half tone or a tone above it. The sign of a trill in music is the syllable *tr* placed over or under the principal note. The trill was known and used at the end of the 16th century.

TRILLIUM, a genus of the family *Liliaceæ,* monocoty-ledonous plants, having all the parts in threes, to which circumstance the generic name refers. They are handsome plants known also as wakerobin, native to North America and Asia. The leaves are triple, in a single whorl, the flower-peduncles arising from the centre. The three petals of the flowers alternate with the same number of sepals. The fruits are large berries, dark red or purple, and sometimes angled. The plants are early blooming smooth perennials, with perpendicular rhizomes ending abruptly and abounding in starch. *Trillium grandiflorum,* which extends from Quebec to Florida and westward, in cool, damp woods, has rhombic, ovate, pointed leaves. The petals are somewhat spreading, pure white or touched with pink, when aged turning to old-rose tints. The painted trillium (*T. undulatum*) is very small, with white petals, narrow and wavy-margined and veined with purple. *T. cernuum* has a white-petal flower nodding on a recurved stalk quite under the leaves, which are broadly rhombic. Other species have green flowers, as *T. viride* and *T. recurvatum,* the latter distinguishable by its reflexed sepals. Two at least are purple-flowered, the blossom of one being sessile (*T. sessile*), and the other (*T. erectum*) having declined flower-stems and reddish purple petals, somewhat acute, and a little longer than the lanceolate sepals. The flowers have a most disagreeable odor, probably attractive to carrion flies, however, and are among the first plants to bloom in the shady, cool woods of eastern America. They are called beth-root or birth-wort, and have a rhizome of sweetish, astringent, acid taste and emetic properties.

TRILOBITE, an early and primitive form of *Crustaceræ* fossil, remains of which are very common in the Paleozoic era. They are doubtless the ancestors of modern *Arachnida,* that is spiders, scorpions and mites. In palæontology, any individual of the order *Trilobita,* so called from the division of the external skeleton into three regions: (1) a cephalic shield; (2) a variable number of body rings and (3) a caudal shield, tail or pygidium. The cephalic shield is usually more or less semicircular, with an elevated portion, the glabella, bounded by the fixed cheeks, to which the free cheeks which bear the eye are attached by the facial suture. The posterior (genal) angles of the free cheek are commonly prolonged into longer or shorter spines. The eyes are sessile, compound and consist of an aggregation of facets, covered by a thin cornea. The number varies greatly, Barrande having found as few as 14 and as many as 15,000 facets in each eye in different types. Behind the cephalic shield comes the thorax, composed of a number of segments (2 to 26), capable of more or less movement on each other; in several genera this freedom of movement was so great that species could roll themselves up into a ball, like a hedgehog. The tail is also composed of a number of segments (from two in *Sao hirsuta* to 28 in the genus *Amphion*), ankylosed or amalgamated. The extremity is sometimes rounded, but may be prolonged into a spine and the ends of the pleuræ of the tail-segments may also be produced into spine-like processes. With regard to the under-surface and appendages of the trilobites much remains to be discovered. The head bears a hypostome or plate in front of the mouth and four pairs of jointed appendages, the basal parts of which were modified to serve as jaws.

From Walcott's examination of sections of rolled-up specimens, it appears that the thoracic appendages were slender, five-jointed legs, in which the terminal segment formed a pointed claw, and the basal segment carried a jointed appendage, homologous with the epipodite of many recent crustaceans. On each side of the thoracic cavity was attached a row of bifid, spiral branchial appendages, and appendages serving also as gills were probably attached to the bases of the thoracic limbs.

Trilobites vary greatly in size, some being scarcely larger than a pin's head, while species of *Asaphus* have been discovered two feet in length. They appear to have lived on muddy bottoms in shallow water, feeding on small marine animals, and probably swam on their backs, as do the recent *Apus* and the larval forms of *Limulus.* The general opinion of zoologists at the present time is that they are related, through the *Xiphosura* and *Limulus,* to the *Arachnida,* and are not crustaceans as formerly believed. Trilobites are characteristic of the Palæozoic system or rocks, and reached their maximum development in the Ordovician. The genera are numerous. (See ARACHNIDA). Consult Zittel and Eastman, 'Text-book of Palæontology'; Walcott, 'Bulletin Museum Comparative Zoology' (Cambridge 1881).

TRILOGY, among the ancient Greeks, a union of three tragedies, connected in subject, which, together with a satirical piece, were performed in immediate succession. There is only one trilogy of antiquity which we can be certain of possessing complete, namely, the 'Orestias' of Æschylus, which contains the 'Agamemnon,' 'Cho phori,' and 'Eumenides.' In modern usage any group of three dramas or operas is so named.

TRIMBLE, trĭm'bl, **Isaac Ridgeway,** American soldier: b. Culpeper County, Va., 15 May 1802; d. Baltimore, Md., 2 Jan. 1888. He was graduated from West Point in 1822, engaged in surveying military roads under the government in 1822–32, and then resigned to pursue the profession of civil engineering. He was afterward engaged as chief engineer on different railroads and at the outbreak of the Civil War joined the Confederate army. He was appointed colonel of engineers in 1861, had charge of the construction of defenses of Norfolk, Va., and later built the batteries at Evansport on the Potomac. He chose the position for the Confederate forces at Cross Keys, 8 June 1862, was engaged at Gaines' Mills, Slaughter Mountain, and at Manassas, and in 1863 was promoted major-general. He took part in the charge of Pickett's division at Gettysburg, where he lost a leg and was taken prisoner. He was exchanged in April 1865 and reached Lynchburg on his way to rejoin Lee, the day after the surrender at Appomattox.

TRIMBLE, Robert, American jurist: b. Berkeley County, Va., 1777; d. 25 Aug. 1828. He removed with his parents to Kentucky in 1831, and there gained with little instruction sufficient education to enable him to teach. He later studied law, was admitted to the bar in 1803 and in that year settled at Paris, Ky., where he engaged in law practice. He was soon afterward chosen to the legislature, was appointed second judge of the Court of Appeals in 1808, and chief justice of Kentucky in 1810. He was United States district attorney in 1813, served as district judge in Kentucky in 1816–26, and from 1826 until his death was a justice of the United States Supreme Court.

TRIMETHYLAMINE (C_3H_9N), an organic chemical compound found in very small quantity in various plants, hawthorn, wild cherry, pear, etc., but contained in considerable amount in herring brine, where it is the result of the decomposition of organic substances containing nitrogen. Obtained usually by the action of heat upon the "vinasses" or residues from the refinery of beet sugar. It can be made in the laboratory by action of methyl iodide upon ammonia. A liquid boiling at 9° to 10° C., soluble in water and possessing a very strong ammoniacal and fishy odor. Its chemical behavior is like ammonia in that its water solution is a strong base which unites with acids to form salts. It may be considered as ammonia NH_3 in which the three hydrogen atoms have been replaced by three methyl (CH_3) groups. The methylamine hydrochloride is used extensively in place of ammonium chloride in the Solvay process for manufacture of potassium carbonate. See CHEMISTRY, PROGRESS OF —*Soda.*

TRIMMER, MRS. Sarah, English writer: b. Ipswich, 1741; d. 1810. She was the author of popular juvenile works, many of which are of an educational character, and her success in founding Sunday schools led to her being summoned to Windsor castle to aid the queen

in similar work. In 1787 she established an industrial school for girls at Brentford which was highly successful. Of her many writings 'Abridgements of the Old and New Testaments' (1793) was given a large circulation by the Society for Promoting Christian Knowledge.

TRIMORPHISM. See ISOMORPHISM.

TRIMŪRTI, trī-moor'tĭ, in the religious system of latter Brahmanism, the Hindu trinity, Brahma, Vishnu and Siva, considered as an inseparable unity. The sectaries of Brahma, Vishnu and Siva respectively make their god the original unity from which the trinity emanates; but considered separately, Brahma is the creating, Vishnu the preserving and Siva the destroying principle of the deity, while Trimūrti is the theological or philosophical unity, which combines these separate forms in one self-existent being. (See BRAHMA; SIVA; VISHNU). The Trimūrti is represented symbolically as one body with three heads, Vishnu at the right, Siva at the left and Brahma in the centre, holding the receptacle for alms and wearing the crown of roses.

TRINCOMALI, trĭng"kō-ma-lē', or **TRIKONAMALAI,** Ceylon, a town situated on Trincomali Bay on the northern part of the east coast. The bay forms a safe harbor of refuge, and is defended by strong fortifications. It has sustained several sieges, and has been held by the Portuguese, by the Dutch twice and by the French three times. It was captured by the British in 1795, and was formally ceded to Great Britain in 1802. Pop. about 11,000.

TRINE, Ralph Waldo, American writer on character building: b. Mount Morris, Ill., 9 Sept. 1866. He was graduated from Knox College, Galesburg, Ill., in 1891, and has published several popular booklets mainly connected with 'New Thought,' including 'What All the World's a-Seeking'; 'In Tune With the Infinite'; 'The Greatest Thing Ever Known' (1898); 'Every Living Creature' (1899); 'The Land of Living Men' (1910); 'The New Alinement of Life' (1913), etc.

TRINE IMMERSION, the name given to the practice in the primitive Church of dipping a person who was being baptized three times beneath the surface of the water, at the naming of the Three Persons of the Holy Trinity. See BAPTISM; BAPTISTS.

TRINIDAD, Colo., city and county-seat of Las Animas County; situated in the extreme southern part of the State, 50 miles east of the Continental Divide, on the Atchison, Topeka and Santa Fé and the Denver and Rio Grande railroads. It was first settled in 1853 by Mexican ranchers; became a town under territorial law in 1872, and a city in 1877. Trinidad is situated in a coal-mining and agricultural region, and derives its business chiefly from mining and trade in agricultural products; there are also railroad shops and a wool-scouring mill, and three banks with a combined capital of $275,000. It contains a Carnegie public library, four public schools, including a high school, a business college, Saint Joseph's Academy and the San Rafael Hospital. The government is vested in a mayor and a board of aldermen of 10 members, elected bi-annually; the waterworks are under municipal ownership. Pop. 14,000.

TRINIDAD, Sp. trē-nē-thäth', Cuba, city, province of Santa Clara, four miles from the southern coast, 40 miles southeast of Cienfuegos. It was founded by Diego Velasquez in 1513. It is connected by railroad with its port, Casilda, and carries on a considerable trade; coffee was formerly its most important export, but the export of sugar is now increasing. It is well situated on high ground, and is one of the most healthful cities on the island. Pop. about 12,000.

TRINIDAD, or **ASCENÃO,** a small uninhabited rocky island in the Atlantic, in lat. 20° 31′ S., long. 29° 20′ W., about 700 miles east of Brazil. Originally discovered by the Portuguese, it had never been claimed or made use of till 1700, when the famous English astronomer, Halley, in the course of a scientific cruise, raised the British flag on the island. No objection was raised by Portugal, to which country, however, the island was transferred in 1782. Since then the island was regarded as a derelict, as no power exercised active possession. In 1880 the English journalist, E. F. Knight, explored the rock and found it littered with dead trunks and branches — the remains of an extinct forest — and swarming with myriads of land crabs, sea-fowl and snakes. There is hardly any fresh water and the island reeked of rotten fish and guano. Access by boat is most difficult, and the water is alive with sharks. The whole area is about five square miles. In 1894 the island had gained a momentary celebrity through the announcement by Baron Harden-Hickey (q.v.), that he had created himself «Prince of Trinidad.» In January 1895, however, the British warship *Barracouta* arrived and landed a party which, climbing up the precipitous rocks, formally read the proclamation of annexation, nailed the British flag on a spar and buried the proclamation in a bottle at the foot. The British government desired to erect a cable station on the island. All the then existing cables between South America and Europe had their western shore-ends at Pernambuco, with the result that Brazil controlled the whole of the direct telegraphic communication of the continent with Europe. The distance between the countries south of Brazil and Europe was too great to admit of a direct cable; hence Trinidad afforded an ideal half-way house. The British annexation roused considerable opposition in Brazil. By mutual consent the dispute was submitted for arbitration to the king of Portugal, who decided in favor of Brazil. Consult Knight, E. F., 'Cruise of the Alert' (London 1890); New York *Tribune,* 11 Feb. 1898.

TRINIL MAN. See MAN, PREHISTORIC RACES OF.

TRINITARIAN, one who believes in the doctrine of the Trinity, the union of three persons, Father, Son and Holy Spirit, in one Godhead. The received doctrine of the Christian Church among Trinitarians holds that it is taught in the Scriptures that there is but one God, and yet that there are three equal subjects in the one Godhead, who are described as persons, but that we cannot determine in what sense these three are separate and in what *sense* they are united in one. The incorporation of

the doctrine of the Trinity in the creeds of Christendom is the result of the attempts to reconcile two seemingly conflicting teachings of the Bible, the first that the Father, Son and Holy Spirit each possess the divine attributes and is worthy to be worshipped, and the second that there is but one God, and that polytheism is sinful.

Under the name Trinitarians, a monastic order (see ORDERS, RELIGIOUS) was founded in the year 1197 by Pope Innocent III for the ransom of Christians captured by the Moors and the Saracens. John de Matha (d. 1213) and Felix de Valois (d. 1212) were the leaders of the order, the former becoming its first general and the latter its first abbot. By 1200 A.D. 200 Christians had been redeemed out of slavery in Morocco by the Trinitarians, and the society spread rapidly in France, Italy and Spain. Aided by Honorius III and Clement IV it afterward spread into Portugal, the United Kingdom, all of south-central Europe and finally to America. From the character of the work done by the order its members came to be known as Redemptionists, and in France by the middle of the 17th century there had been 246 redemptions, releasing 30,720 prisoners, while the numbers for Castile and Leon were 362 redemptions and 11,809 prisoners. By the 18th century the order possessed over 300 houses, but it was rapidly nearing its end, which came in the latter half of that century; it is now almost extinct, having outlived its usefulness.

TRINITROPHENOL. See PICRIC ACID.

TRINITROTOLUENE, or **TNT,** $C_6H_2(CH_3)(NO_2)_3$, a high explosive, the final nitration product of toluene, is obtained by the energetic treatment of this hydrocarbon with strong nitric acid in the presence of concentrated sulphuric acid. The reaction takes place in three stages, with the formation of mononitrotoluene and dinitrotoluene as intermediate products. The compound has also been prepared on a large scale by dissolving orthonitrotoluene in 100 per cent sulphuric acid at 60–70° C.; a mixture of nitric and sulphuric acids is allowed to run into the solution in a fine stream with constant stirring and cooling. Under these conditions the formation of dinitrotoluene is indicated by a drop in temperature. In order to complete the reaction, the mixture is maintained at a temperature of 120–130° C. for one hour. An increase in yield is claimed by the addition of water to the reaction mixture at 100° C. During the process of manufacture a number of inorganic salts are produced by the action of acids on nitrating chambers; these impurities act as catalysers and promote the formation of nitrated cresols and other by-products, which may form unstable salts with metals, causing premature explosions. It is, therefore, necessary to prepare a compound of high purity. For this purpose the crude product is removed from the nitrators as soon as the desired reaction comes to an end, and purified by first washing with boiling water; volatile impurities are removed by keeping the compound at 95–100° C. for several hours; it is then crystallized from a mixture of 90 per cent alcohol and benzene. Patents have also been issued dealing with purification by dissolving in hot concentrated sulphuric acid and extracting the product by dilution and cooling. The compound has further been purified by recrystallization from orthonitrotoluene.

Pure trinitrotoluene crystallizes in almost white needles which melt at 80.6° C., and possess a density of 1.6. Its density may be increased to 1.7 by melting and pouring into shells, or by allowing the molten mass to cool under pressure. It dissolves readily in alcohol, acetone, benzene, toluene, nitrotoluene, and fairly readily in hot concentrated sulphuric acid.

Although trinitrotoluene does not quite possess the detonating power of picric acid, in many respects it is decidedly superior to this competitor. At ordinary temperatures it is a perfectly stable explosive; it may be compressed into shells, mines, torpedoes and into slabs or cylinders with perfect safety, and the pressed charges withstand impact of high power bullets without exploding. The compound is non-hygroscopic, and its dust or vapor are not irritating. Having no acid properties it is inert in the presence of metals or their oxides. When ignited it burns with a smoky flame, and when detonated with mercury fulminate it leaves no poisonous vapors or gases, and having a much lower melting point than picric acid, it may be poured into shells at lower temperatures. On account of these properties trinitrotoluene has been extensively employed, sometimes in preference to picric acid, as an explosive for shells, mines, hand grenades and torpedoes. It has also been used in safety detonators. Being somewhat deficient in oxygen, it is often mixed with potassium chlorate, lead nitrate and other compounds that can supply the necessary oxygen.

Trinitrotoluene exists in six isomeric modifications. These are of practically the same value as explosives. The commercial product usually contains the symmetrical compound (1-methyl 2, 4, 6-trinitrobenzene), although the other isomers may also be present.

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TRINITY, (1) a river which has its rise in the Shasta Mountains and flows through Trinity County, in the northeastern part of California. It has two forks and empties into the Klamath River in Humboldt County. Its length is about 250 miles. (2) A river in Texas which has its rise in a group of streams north of Dallas and Fort Worth in the northern part of the State. It flows east and southeast and enters Galveston Bay, an arm of the Gulf of Mexico. The total length is 560 miles. At high water it is navigable for small boats a distance of 500 miles. It flows through a rich agricultural country.

TRINITY BAY, Newfoundland, a large irregular bay on the southeast coast, cutting off, together with Placentia Bay, the peninsula of Avalon from the main part of the island. Its chief port is Heart's Content.

TRINITY COLLEGE, Cambridge, England, founded by Henry VIII in 1546 on the site and out of the revenues of Michael-house (1324), King's Hall (1337), and other ancient societies, is the largest college of the university. To the 60 fellowships and scholarships of the foundation Queen Mary added 20 scholarships. The scholarships, which are tenable up to the M.A. degree, have a yearly value of from $150 to $500, the sizarships of about $350, and there

are further three annual minor scholarships of $350 and three of $250, tenable for three years, besides 16 exhibitions for scholars from Westminster, Saint Paul's, Lynn, Shrewsbury, etc., and numerous prizes. The fellows, with certain exceptions, must take holy orders within seven years after their M.A., and the college may elect professors or other distinguished literary or scientific men to regular or honorary fellowships. Trinity is more conspicuous for the extent than the special architectural beauty of its buildings. Noteworthy, however, are Nevill's Fountain, the three great gateways by which the three chief courts are entered, the Gothic Hall with its high-peaked roof, the chapel (re-decorated 1875), the library designed by Wren and containing 100,000 volumes, the Master's Lodge, with its state-rooms, where royalty and the judges are received, and the rich collection of busts and statues of former members — of Newton by Roubillac, Porson by Chantrey, Byron by Thorwaldsen, Barrow, Macaulay, Whewell, Sedgwick, Tennyson, etc. The gross income in 1917 was £81,472 and the undergraduates numbered 595, with 3,255 members on the boards.

TRINITY COLLEGE, located at Durham, N. C. It was founded as a school of secondary grade in 1838 and was then located in Randolph County; in 1851 it became a normal college and the next year established a full college course and was granted power to confer degrees. In 1857 it was placed under the control of the North Carolina Conference of the Methodist Episcopal Church, South, and in 1859 the name was changed to Trinity College. During the Civil War the college was compelled to close, and was reopened in 1866. In 1891 it was moved to its present site in Durham. Women were admitted to all privileges of the college in 1896. The college offers three groups of studies, all leading to the degree of A. B., the first group requires Latin and Greek in the first two years, the second group substitutes French or German for Greek, and the third group is for students intending to do advanced work in mechanical, electrical or civil engineering; the work of the last three years is partially elective. Provision is also made for graduate work for which the degree of A.M., is conferred. There are 50 scholarships and two loan funds for the aid of poor students; tuition is free for those studying for the ministry. A new charter extending the scope of its activities was granted in 1903. The grounds, consisting of 73½ acres, are known as Trinity College Park, and are under the municipal government of Durham; the buildings include the Washington Duke building, the Crowell Science building, the Epworth building, the Mary Duke building, the Craven Memorial hall, the Angier Duke gymnasium, a dormitory (erected 1902) and the library of 52,000 volumes (completed 1903). The productive funds in 1917 amounted to $1,641,000, the increase being largely due to donations from James B. and N. Duke; the students numbered 705 and the faculty 52.

TRINITY COLLEGE, Hartford, Conn., was founded by Bishop Brownell of the Protestant Episcopal Church in 1823 and was then chartered as Washington College. In 1845 the name was changed to Trinity College; in 1872 the original campus was sold to the city of Hartford as the site for the State Capitol and the college moved to its present site in the suburbs. The college offers (1) a course in arts leading to the degree of A.B.; (2) a course in science, leading to the degree of B.S.; (3) a course in civil engineering, added to the curriculum in 1903–04; those taking this course may receive either the degree of A.B., or B.S., according to their electives; (4) graduate courses leading to the degrees of M.A., and M.S. The college has a large number of scholarships, two fellowships and several graduate scholarships. The principal buildings are of brown stone, secular Gothic in architecture. The library in 1918 contained 85,000 volumes. The productive funds amounted to $1,618,000. The average attendance is about 250 and the faculty numbers 25.

TRINITY COLLEGE, Ireland, is said to have been founded by Queen Elizabeth in 1591. Some authorities, however, assert that she merely endowed and Protestantized the school and that its establishment was due to Alexander Bigner or Bignor, an ecclesiastic of the 13th century. It is the largest and most important educational institution in Ireland and has extensive buildings which enclose several quadrangles. Corinthian columns ornament the principal front, the chapel has a Corinthian portico and the decorations of the fine library are also Corinthian. See DUBLIN, UNIVERSITY OF.

TRINITY COLLEGE, Oxford, England, was founded by Richard de Hoton, prior of Durham, in 1290, for the education of the student monks of Durham. It was rebuilt and improved by Sir Thomas Pope in 1554, and after Balliol was the first college re-endowed by a layman, and further remarkable in view of the Reformation, as being, like Saint John's, indebted for this to a Roman Catholic. The faculty consists of a president, 12 fellows, several honorary fellows and lecturers. There are 21 scholarships, nine exhibitions, and the average annual attendance of undergraduates is about 200. The college has in its gifts 10 church livings. The buildings surround a fine quadrangle and include a Renaissance chapel, built in 1694, in which is a fine altar-piece and a beautiful carved screen. Among the distinguished alumni are Sheldon, Ludlow, Ireton, Newman, Pitt, North, Stubbs, Rawlinson and Bryce. The gross income in 1917 was £10,024 and the undergraduates numbered 158.

TRINITY COLLEGE, a Roman Catholic institution for the higher education of women, located at Washington, D. C. It was founded by the Sisters of Notre Dame (Namur), and was first opened to students in 1900. It offers two college courses leading to the degrees of A.B., and B.L., respectively; and has no preparatory department. The library in 1917 contained over 15,000 volumes; the income amounted to $25,000; there were 10 instructors and the students numbered 281

TRINITY COLLEGE, University of, situated at Toronto, Canada, and federated, since 1903, with the University of Toronto. The University of Trinity College was founded by royal charter in 1852, and up to 1903 conferred degrees in arts, divinity, medicine, law, music, dentistry and pharmacy. At present, under the terms of the federation with the Uni-

versity of Toronto, Trinity University confers degrees, under its own charter, only in the faculty of divinity and co-operates with the University of Toronto in giving instruction in the faculty of arts, the degrees in this faculty and in all other faculties, except divinity, being conferred by the University of Toronto. Trinity Medical College, which prior to the federation was the teaching body in the faculty of medicine, was amalgamated in 1903 with the Toronto Medical College to form the faculty of medicine in the University of Toronto. The arts courses are open to both men and women. The divinity courses are maintained in close connection with the Church of England in Canada and students are prepared for the ministry of that Church. Trinity College has always made residential collegiate life one of its prominent features, the men students residing in Trinity College and the women students residing in Saint Hilda's College, which is open only to women students of the University of Toronto enrolled in Trinity College. See also TORONTO, UNIVERSITY OF.

TRINITY DOCTRINE, the Christian doctrine of the triune nature of God. The doctrine of the Trinity is nowhere expressly taught in the Old Testament. The doctrine in regard to the divine nature which is most strongly insisted on throughout the Old Testament is the unity of God as opposed to polytheism, and by the names by which God revealed himself to Moses (Ex. iii, 14, 15, and other passages) it is implied that the divine nature is inscrutable to human intelligence. The plural form used to designate the Deity in the account of the creation, and many other incidental circumstances or expressions, are, however, held as implying, if not teaching, this doctrine.

In the New Testament it is evident that the doctrine of a Trinity in the divine nature is clearly and copiously taught. In the Gospels Christ himself asserts a mysterious union between himself and the Father, appropriates to himself by an evident allusion the mysterious name of God revealed to Moses, and repeatedly refers to the Holy Spirit along with the Father as partaking of the same divine nature and union. The same doctrine is implied in the teaching of John, the forerunner. In the baptism of Christ by him the Holy Spirit is represented as descending visibly upon him while he is recognized by an audible voice from the Father, and in the rite of baptism instituted by Christ the names of Father, Son and Holy Ghost are used as the joint designation of the divine being. The apostles and other writers of the New Testament Epistles constantly employ this form both in the introductory assertion of their authority and in their closing benedictions.

Among the definitions which resulted from the conflict of opinion in the early Church with regard to the doctrine of the Trinity, that which was adopted by the Catholic Church, and is generally accepted by orthodox Christians, fairly claims the merit of the fullest harmony and most comprehensive consistency with the various statements of Scripture. It is that there are in the Godhead three persons, one in substance, coeternal, equal in power, the Father, Son and Holy Ghost. It was only, however, after a severe and protracted conflict that this definition came to be generally accepted, and as soon as the definition proceeds one step further a wide schism again separates the Church. The Eastern Church holds that the Holy Ghost proceeds from the Father; the Western, throughout all its divisions, adopting the amended form of the Nicene Creed, holds that he proceeds from the Father and the Son. The three creeds commonly called the Apostles', the Athanasian and the Nicene, all contain the points of agreement between the two divisions of the Church, while on the point of difference the Athanasian and the commonly known form of the Nicene express the faith of the Western Church. The word "Trinity" is not in Scripture. The term persons is not applied in Scripture to the Trinity, but something analogous to the conception of personality seems to be implied in the apostolical arguments of the epistles. See ARIANISM; NICÆ, THE COUNCILS OF; NICENE CREED; UNITARIANISM.

TRINITY HALL, an English college at Cambridge, founded in 1350 by William Bateman, bishop of Norwich. It continues to be the legal college of the university under the new statutes in force since 1882 and presents seven livings. Consult Malden, H. E., 'Trinity Hall' (London 1902).

TRINITY HOUSE, Corporation of the. An old English religious corporation dating back to the reign of Henry VIII and managed by a board called the Elder Brethren, selected from the naval and the merchant service. It now controls the more important lighthouses, light-ships and fog signals on the English Coast. Its headquarters are in London and its specific duties are lighting and buoying the Thames and adjacent coast.

TRINITY RIVER, a Texan stream flowing southeast and emptying into Galveston Bay about 40 miles north of the city of Galveston. It is formed from a network of small streams in Montague, Jack, Denton, Parker and Wise counties and frequently runs dry above Dallas. It is over 500 miles long.

TRINITY SUNDAY, so called from being set aside in special honor of the Trinity. It comes directly after Whitsunday and was established as a common festival by decree of John XXII who died 1334.

TRINODA NECESSITAS, a triple tax imposed for public purposes from which no lands, whether used for secular or religious purposes, were exempt in Anglo-Saxon times. These taxes were for the maintenance of bridges and highways, for the erection and keeping in repair of fortresses and for the support of the king's naval and military forces.

TRINUCLEUS (from the Latin *tres,* three, and *nucleus,* little nut). A trilobitic genus of the middle and upper Ordovician rocks. The body seldom exceeds an inch in length and has a broad horseshoe-shaped head shield. The head is bordered by a wide pitted margin; the glabella is convex and consists of a prominent median and two less elevated lateral lobes. In some forms the young were provided with simple eyes. The thorax had six segments with narrow axis.

TRIO, *in music,* a composition for three voices or for three instruments. In a specific sense the term "trio" is used to indicate a middle section in a composition and derived its

name from the three-part writing in this middle section employed by the old composers.

TRIONAL, a harmless hypnotic, best administered in hot milk. It is a white crystalline powder prepared by the action of methyl-ethyl ketone upon mercaptan and the oxidation of the resulting product by permanganate of potassium. It melts at 169° F., and is readily soluble in alcohol, but sparingly so in water.

TRIPALMITIN. See PALMITIN.

TRIPHENYLMETHANE DYESTUFFS. See COAL-TAR COLORS.

TRIPHENYLMETHYL, obviously a derivative of the radicle methyl which cannot exist independently. This remarkable substance was discovered by Gomberg in 1901 and may be prepared by the action of metals on chlorotriphenylmethane. It forms a colorless crystalline solid, melting at 293° F. and acts as a highly-unsaturated compound which when dissolved in liquid sulphur dioxide conducts the electric current.

TRIPHYLITE. See LITHIOPHILITE.

TRIPITAKA. See PITAKA.

TRIPLE ALLIANCE, a name applied to various international agreements, the earliest being that concluded in 1668 between England, Holland and Sweden, with the object of opposing the advance of France. Within two years, however, Charles II of England signed a treaty with the French king, binding himself not to interfere with the French designs on the Netherlands.

(2) An alliance formed in 1717 between England, France and Holland, guaranteeing the clauses of the Treaty of Utrecht referring to the English Protestant succession, the French succession and the renunciation by Spain of her claims to the throne of France. It was intended as a counterpoise to the alliance of Russia, Sweden and Spain, and by the adhesion of Austria became the Quadruple Alliance in 1718.

(3) The Triple Alliance (India) was formed between the English, the Peshwa and the Nizam in 1790 with the object of invading the dominions of Tippoo Sahib and equally sharing them between the contracting parties.

(4) The alliance of Brazil, Argentina and Uruguay in the war waged against Paraguay from 1865 to 1869.

(5) The most important Triple Alliance, and the one usually intended by the term, is that concluded between Austria-Hungary and the German Empire in 1879, to which Italy became a party in May 1882. The text of the treaty of alliance between Austria-Hungary and Germany — which is not subject to periodical renewal — was first made public on 3 Feb. 1888. That between Italy and Austria-Hungary was never made public until 1915, after Italy's denunciation of it on 4 May and declaration of war against her former ally, Austria, on the 23d. The preamble of the treaty between Germany and Austria-Hungary of 1879 declared that a "solid alliance" between the two empires "can threaten no one, but is rather calculated to consolidate European peace as created by the stipulations of the Treaty of Berlin" (of 1878). The two emperors, therefore, solemnly promised each other "never to give an aggressive tendency whatever to their purely defensive agreement."

Article I of the treaty reads as follows:

"If, contrarily to what may be hoped and contrarily to the sincere wishes of the two high contracting parties, one of the two Empires were to be attacked by Russia, the two high contracting parties are bound to lend each other reciprocal aid with the whole of their imperial military power, and, subsequently, to conclude no peace except conjointly and in agreement."

Article II declares that:

"If one of the two high contracting parties were to be attacked by another Power, the other high contracting party binds itself, by the present act, not only not to uphold the aggressor against its high ally, but at the least, to observe a benevolent neutrality with regard to the contracting party aforesaid."

"If, however, in the case previously mentioned, the Power attacking were to be upheld by Russia, whether by way of active cooperation or by military measures that should threaten the Power attacked, then the obligation of reciprocal assistance with entire military forces — obligation stipulated in Article I of this Treaty — would immediately become executory, and the military operations of the two high contracting parties would also, in such circumstances, be conducted jointly until the conclusion of peace."

Ex-Chancellor Prince von Bülow in his book on 'Imperial Germany' thus describes the purpose and results of the alliance: "It was neither the desire of conquest nor unsatisfied ambition that brought the states of the Triple Alliance together and keeps them united. The three mid-European states are bound to each other by the firm resolve to maintain the existing balance of power in Europe, and should a forcible change be attempted, to prevent it if need be by force. The united strength of middle Europe stands in the path of any revolution — any European policy which might elect to follow the courses pursued by Louis XIV or Napoleon I. This alliance is like a mighty fortification dividing the continent in two.

"The founders of the Triple Alliance intentionally created a guarantee of peace. They have not been disappointed in their hopes, for the steadfastness of the Triple Alliance has more than once in the course of the last thirty years warded off the rising danger of war." He concludes with the observation that "The Triple Alliance as a guarantee of peace has proved its worth for thirty years and this justifies our hopes."

This defense of the Alliance was written shortly before the outbreak of the Great European War since which time Italy has ceased to be a member of it. Italy's position as a member of the Alliance was from the first peculiar, if not unnatural, and it is well known that she joined it with more or less misgiving if not reluctance, largely in consequence, it is said, of pique at the acquisition of Tunis by France. That she should have entered into an alliance with Austria which excised dominion over nearly a million Italians occupying considerable territories to which Italy had never ceased to lay claim and which she still hoped eventually to recover can only be explained by the Ital-

ian suspicion of the designs of Great Britain and France in the Mediterranean region. The alliance by its very nature, therefore, contained the seeds of its own dissolution. The national aspiration for "Italia Irredenta" continued to be a source of irritation between Austria and her neighboring ally, and as time passed the ties which bound them began to snap. The first shock came in 1908 on account of the annexation by Austria of Bosnia and Herzegovina, an act which greatly irritated the Italians who regarded with regret if not fear the extension of Austrian power and influence in the Balkans. The weakness of the bond had already been revealed to the world in 1906 at the Algeciras Conference, when Italy broke away from her allies and acted with Great Britain and France against Germany and Austria-Hungary. Furthermore, Italy's war against Turkey in 1911 and 1912 and her subsequent annexation of Tripoli and Cyrenaica was regarded by Germany, Turkey's protector, with regret, for Turkey in effect was now to all intents and purposes a member of the alliance. Germany had been compelled to stand by and see her Ottoman protége stripped of her possessions by an ally which refused to consult Germany or consider her suggestions. This action of Italy still further revealed how loosely she was bound to her allies and particularly her independence of Germany in the conduct of her foreign policy. The alliance was again weakened by the outcome of the Balkan wars. Although Austria and Italy had acted together in thwarting Serbia's aspirations for an outlet on the Adriatic, in creating Albania an independent state under international supervision, the seeds of future discord between Austria and Italy were sown, since it marked the beginning of a diplomatic struggle between the two powers for control of the newly-established state.

On 8 Dec. 1912 it was announced from Vienna that the Triple Alliance had been renewed "without any change." The announcement created a mild surprise in other countries; in Austria itself it caused a panic on the Bourse and a run on the savings banks in Galicia. The last time the treaty had been renewed was in 1902 for 12 years, and would consequently not have expired till May or June 1914. Conflicting reports stated that the renewal was for 12 years or two terms of six years; also seven years. The Austrian press dwelt on the pacific character of the alliance and declared the renewal as "a clear hint to all whom it may concern." It was recalled that Bismarck had published the terms of the treaty in 1888 at a moment when Austro-Russian relations were strained. Italy, it was known, had two treaties, one with each of the other two contracting parties. In 1912, also, an attitude of growing opposition was manifesting itself in Italy against Austro-Hungarian action with regard to Serbia. In German naval circles efforts were made to give the alliance a definite significance for naval as well as for military defense, in the sense of binding Germany's partners to provide naval "compensations" for the increased military expenditure of Germany in order that the naval power of the Triple Entente (q.v.) might have to be strengthened in the Mediterranean and so, perhaps, be weakened in the North Sea. A more drastic attitude was adopted by a general officer writing in the *Zeit*, a German diplomatic organ (8 Dec. 1912). He argued that Russian boldness had its root in the "infamous alliance" with France, and the situation could only be saved if the Powers of the Triple Alliance adopted the formula that Russia must not be allowed to mobilize, and that the Alliance must fall immediately upon France and crush her before Russia could intervene. One victory on French soil, he stated, would cure Russia of her fondness for the French alliance. The paper editorially declared that these ideas prevailed in a great part of the Austro-Hungarian corps of officers. In any case, it was evident that the renewal of the alliance "without change" left the de facto situation in Europe unaltered. Already in 1902 M. Delcassé, then French Minister of Foreign Affairs, informed the Chamber of Deputies that the Italian government had given the assurance to France that "the policy of Italy as resulting from her alliances was neither directly nor indirectly directed against France" and that "in no case and in no form can Italy become either the instrument or the auxiliary of aggression against this country" (3 July). This inspired prophecy was destined to be verified 12 years later in the European War, when Italy refused to join her allies against France and, in 1915, threw her weight on the side of the Entente Powers. Italy now saw an opportunity to realize her irredentist aspirations by joining in the war against Austria.

Under the terms of the treaty of 1882 between Italy and Austria-Hungary, by which treaty Italy became a member of the Triple Alliance, Italy bound herself in certain circumstances to come to the aid of her allies in case they should find themselves in war with another power or powers. Article III of this treaty reads as follows: "If one or two of the High Contracting Parties should be attacked without direct provocation on their part, and be engaged in war with two or several great powers not signatory to this treaty, the *Casus fœderis* shall apply simultaneously to all the High Contracting Parties." Article IV declares that:

"In the event that a Great Power not signatory to this Treaty should menace the safety of the States of one of the High Contracting Parties, and that the menaced Party should be forced to make war on the Power, the two others bind themselves to observe toward their ally a benevolent neutrality. Each one of them in that case reserves to herself the right to participate in the war, if she should consider it appropriate to make common cause with her ally."

During the negotiations preceding Italy's entrance into the war in 1915 the Italian government contended that these stipulations bound Italy to come to the aid of her allies only in the case of a defensive war. Regarding her allies as the aggressors in the war of 1914 she did not consider, therefore, that a *casus fœderis* existed. Moreover the Italian government complained that the Austro-Hungarian government had violated article VII of the treaty of 1882 by failing to communicate to the Italian government the terms of the Austro-Hungarian demands of 23 July 1914, upon Serbia, which preceded the declaration of war by Austria against Serbia. The answer of the Austro-

Hungarian government that the note to Serbia had not been communicated to the German government, that Germany had not been consulted regarding Austria's relations with Serbia and that the Italian government had been assured that Austria-Hungary had no designs of conquest in Serbia, was not regarded as satisfactory. After protracted negotiations between Italy and Austria-Hungary, in which the Italian government demanded the cession of certain Austrian territories to Italy which Austria at first refused, but afterward partially agreed to but not to take effect till after the war, the Italian Parliament in May 1915 declared that the Triple Alliance had been dissolved by the failure of the Austro-Hungarian government to acquaint the Italian government with the terms of the ultimatum to Serbia. In a note handed by the Italian Ambassador at Vienna to the Austro-Hungarian Minister of Foreign Affairs, the former referred to the Triple Alliance as having been entered into as a guarantee of peace and defense, the observance of which would have sufficed to furnish a solid basis for common and effective action. "Austria-Hungary," the note went on to declare, "in ignoring the obligations existing under the treaty, profoundly disturbed the *status quo* in the Balkans and created a situation from which she alone was destined to profit to the disadvantage of interests of the greatest importance, which her ally had many times affirmed and proclaimed. So flagrant a violation of the letter and the spirit of the treaty,— not only justified the refusal of Italy to place herself on the side of her allies in a war provoked without her knowledge, but at the same time deprived the alliance of its essential meaning and of its reason for existing." See ITALY AND THE WAR; AUSTRIA-HUNGARY AND THE WAR; WAR, EUROPEAN: HISTORICAL INTRODUCTION; DIPLOMATIC HISTORY.

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TRIPLE ENTENTE, The. In the literature of international law and diplomacy the term "Triple Entente" has reference to an understanding embodied in certain formal conventions and diplomatic conversations between Great Britain, France and Russia. It differs from the former Triple Alliance (q.v.) between Germany, Austria-Hungary and Italy in that the parties to the latter solemnly bound themselves by a common treaty to act together for the maintenance of the balance of power and the preservation of the European peace, and that in certain contingencies each would lend its armed support to its allies in case of war. The Triple Entente had less of the character of a formal alliance. It did not rest upon a common treaty between the three parties, by the stipulations of which each pledged itself to come to the assistance of the other in case of war, but upon a series of treaties and understandings between France and Russia, between Great Britain and France and between Great Britain and Russia, by which their various differences were settled and by which they agreed to act together in the future in the maintenance of their common interests and that in certain eventualities they would come to each other's assistance with their naval forces in defense of those interests.

Like the Triple Alliance, however, the Triple Entente evolved out of a dual agreement, namely, the diplomatic understanding between France and Russia concluded in 1891. The text of the document embodying the terms of this agreement had never been made public, but its purpose as announced was the maintenance of the peace and the balance of power in Europe. In the following year the Russo-French understanding was strengthened by the conclusion between the governments of the two countries of a "military convention," providing for the joint co-operation of their armed forces against a common enemy, and in 1894 this was succeeded by the conclusion of an alliance (the "Duplice" or "Dual Alliance") between the two governments. The texts of both these two last-mentioned agreements and even their exact dates have likewise been kept secret, but in August 1897, during an exchange of toasts between the Tsar of Russia and the President of the French Republic the existence of the alliance, though not its terms, was publicly announced and proclaimed. This understanding with Russia was no doubt entered into at the instance of France as an offset to the Triple Alliance between Germany, Austria-Hungary and Italy. The idea of *revanche* against Germany for the loss of Alsace-Lorraine had by no means been abandoned by the French, and now that France had been encircled by a group of powers including her old enemy, Germany, bound by a treaty of alliance, she turned her eyes toward Russia, who had her own grievances against Germany, and between whom and France strong economic bonds were being created through huge investments of French capital in the Muscovite Empire and through enormous loans to the Russian government by French capitalists. These advances were cordially received by Russia and thus the alliance was easily concluded.

The alliance between France and Russia was now followed by a *rapprochement* between Great Britain and France, for a century traditional enemies of each other in Europe, Africa and America. For a long time Great Britain, secure in the protection of her fleet, and geographically separated from the continent by the English Channel, had pursued a policy of "splendid isolation," eschewing international alliances and avoiding intervention in the disputes of continental Europe. With her undisputed mastery of the sea she did not need the support of allies to protect her interests at home or in her colonial dominions. But, in consequence of the policy of conscription by which the German army was eventually made the most powerful military organization in the world and in consequence of the rapid building by Germany of a powerful navy which, rightly or wrongly,

Englishmen believed was intended to destroy their supremacy on the seas, the British policy of "splendid isolation" was abandoned and Great Britain like France began to look about for continental allies against the real or fancied designs of Germany. The Fashoda incident of 1898 which brought France and Great Britain to the verge of war with each other was quickly forgotten and the two governments, in the presence of a power which they regarded as a common enemy and which had strengthened its position by alliances, now drew together. In 1903 following an exchange of visits by the heads of the two states and representatives of both Parliaments, the two governments entered into a general treaty of arbitration by which they agreed to settle by judicial methods all disputes arising in the future between them, with certain exceptions. This agreement opened the way for the conclusion in the following year of a closer *rapprochement* and the definite settlement of all outstanding disputes between the two nations, some of which were irritating and of long duration. This *rapprochement* owed its success largely to the *savoir faire* of King Edward VII, whose admiration for French manners and French culture caused his advances to be favorably received by the government of the republic. The skilful diplomacy of Lord Lansdowne, Sir Edward Grey, M. Delcassé and M. Paul Cambon likewise facilitated the bringing about of what came to be known as the *Entente Cordiale*. By a "Declaration" dated 8 April 1904, and cast in the form of a treaty, the old source of irritation between the two countries due to the British occupation of Egypt since 1882 was removed. The government of France agreed that it would no longer oppose the British occupation of Egypt by insisting upon a time limit for the termination of the occupation, in return for which the British government promised to recognize the special interests of France in Morocco, particularly her right to preserve order in that country and to provide assistance, economic, financial and military, to the Moroccan government to enable it to establish the necessary reforms, subject to certain treaty rights of Great Britain therein and subject also to certain interests which Spain by virtue of her geographical position and her territorial possessions on the Moorish coast had in the country. This mutual engagement was to be binding for a period of 30 years, and was to be extended at five-year intervals thereafter unless expressly denounced by one of the parties upon one year's notice.

In the same year the century-old conflict between France and England regarding French treaty rights in the fisheries on the coasts of New Foundland were amicably settled by compromise.

Germany regarded the agreement of 1904 by which France was given a free hand in the commercial, if not the political, exploitation of Morocco — an agreement as to which Germany had not been consulted — as one which ignored her own rights therein and threatened her safety. Following the sudden and somewhat dramatic landing of the German Emperor at Tangier on 31 March 1905 — an incident which was intended to serve notice on Great Britain and France that they would not be permitted to partition the territories of North Africa between them without consulting Germany — a demand was made by Germany that the whole question should be submitted to a conference of the powers interested. The conference met at Algeciras in 1906, but on account of the defection of Italy from her allies (see TRIPLE ALLIANCE) and the lending of her support to England and France, the resulting agreement was a disappointment if not a humiliation to Germany, for it practically confirmed the rights claimed by France. Germany for the moment accepted the agreement formulated by the Algeciras Conference, but subsequently claiming that France was ignoring the principle of the "open door" in Morocco and was interfering with the rights of German subjects therein, the German government sent a warship (the *Panther*) to Agadir in July 1911, ostensibly to protect German interests but in reality, as it was believed in England and France, for purposes of aggression. War between Germany and France for some weeks hung in the balance, but it was averted by two treaties (November 1911) by which France agreed to cede a portion of the French Kongo to Germany, in return for which Germany promised to recognize Morocco as a French protectorate and to withdraw from further opposition to French control therein. During this crisis, England let it be known that she would support France against German aggression upon her rights in Africa. In the following year the *Entente Cordiale* ripened into what was in effect an alliance for certain purposes between Great Britain and France. This understanding was embodied in an exchange of notes between Sir Edward Grey, then British Minister of Foreign Affairs, and M. Paul Cambon, the French Ambassador at London, in which it was agreed that if either government "had grave reason to expect an unprovoked attack by a third power, or something that threatened the general peace, it should immediately discuss with the other whether both governments should act together to prevent aggression and to preserve peace, and if so, what measures they would be prepared to take in common." It was in pursuance of this understanding, of which M. Cambon on 30 July 1914, when the German attack on France was imminent, reminded Sir Edward Grey, that the latter on the 2d of August 1914, informed the French Ambassador that he was authorized by the Cabinet to give assurance that in case the German fleet should come into the channel or through the North Sea to undertake hostile operations against the coasts of France, the British fleet would give all the protection within its power.

Finally, in 1907, Great Britain and Russia, between whom good relations were temporarily strained during the Russo-Japanese War on account of the Dogger bank incident and both of whom had become rivals in Persia, settled their disputes and laid the foundations of an *Entente Cordiale* which ripened into an alliance in 1914. The Anglo-Russian convention of that year, like that between Great Britain and France, eliminated certain long-standing disputes regarding their spheres of influence in the Orient. By the terms of the Convention the northern portion of Persia was declared to be within the Russian sphere of influence, while the southern part was similarly assigned

to Great Britain. In the same year a naval convention similar to that between France and Russia was concluded between the two powers providing for the joint co-operation of their navies in certain contingencies.

Thus as a result of these several conventions and understandings between France and Russia; between England and France; and between England and Russia, the Triple Alliance found itself at the outbreak of the present war confronted by the Triple Entente. Already by 1904 an *Entente Cordiale* between Italy and France had been brought about and when Italy repudiated the Triple Alliance in May 1915 and joined Great Britain, France and Russia in the war against Austria-Hungary, the *Triple Entente* became a quadruple entente, if not an alliance in the strict sense of the word. See also MOROCCO; TRIPLE ALLIANCE.

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TRIPLER, Charles Eastman, American inventor: b. New York, 10 Aug. 1849; d. Liberty, N. Y., 20 June 1906. Early in life he became an expert mechanician, and in 1871 constructed several models of canal boats propelled by their own motive power. In 1872 he was engaged on a naphtha engine to be used in launches, its principle being the recondensation of naphtha so that it could be used over and over. Experiments in the field where he afterward became distinguished were also begun at this time. In the early part of 1890 he made his first regenerative coil, and he shortly discovered principles hitherto unutilized in the process of liquefying air. About 1895 he was widely advertised as the discoverer of liquid air. See LIQUEFIED AND COMPRESSED GASES.

TRIPLET, *in music,* a combination of three notes to be played in the time of two. They are joined by a slur and distinguished by having the figure 3 above them.

TRIPOD. This name, signifying generally any three-legged utensil, came to be applied to a bronze altar consisting of a caldron raised on a three-legged stand of bronze. Such was the altar of Apollo at Delphi. It had a round flat plate on the top, on which the priestess sat when giving responses. Tripods of fine workmanship and of precious metal were placed in later times as votive gifts in the temples, especially those of Apollo (q.v.).

TRIPOLI, North Africa, the capital of the Turkish vilayet of Tripoli, situated on the Mediterranean Coast, 100 miles from the boundary of Tunis. It is the Œa of the Phœnicians, and lies in a fertile region, is surrounded with a wall, with its domes and slender minarets, has a pleasing aspect. It is a clean and comparatively well-built city, with a handsome palace of the bey, good caravansaries, public baths, numerous mosques and two Christian churches. It was formerly the centre of a large slave trade but now there are manufactures of carpets and cloths and a considerable caravan trade over Sahara. The exports are esparto, barley, ivory, skins, ostrich feathers, etc. The imports are mainly from Great Britain, being foodstuffs, metals, machinery and hardware. It was in Tripoli Harbor that Lieut. Stephen Decatur in 1804 recaptured and fired the United States frigate *Philadelphia.* Pop. of the town about 30,000; of the district (Tripolitania) 73,000.

TRIPOLI, North Africa, formerly a Turkish province, but since 1912 annexed to Italy, situated along the Mediterranean Coast from Egypt to Tunis, and extending inland from 60 to 600 miles to the Libyan Desert and French Sahara. It consists of Tripoli proper, the semi-detached district of Barca or Benghazi in the northeast and the oasis district of Fezzan in the south, and is bounded on the north by the Mediterranean Sea, on the south by the Sahara, on the east and southeast by the Libyan Desert and on the west by Tunis. The total area of Tripoli and its dependencies is about 406,000 square miles.

Topography.— There are practically no harbors of any importance with the exception of Tripoli, the capital city, as the coast line stretches for over 700 miles in an irregular line and is almost unbroken by protecting headlands or indented with bays. The eastern half forms the Systis Major or Gulf of Sidra and is broken by numerous rocky points, which are, however, of insufficient size to form harbors; the western half, extending from the Gulf of Cabes, or Lesser Syrtis, east to Mesurata Point, is low and sandy. The greater portion of the interior, even up to the Mediterranean shores, is a desert country consisting of sandy plains or naked mountains and plateaus. Two mountain ranges stretch from west to east, running nearly parallel to the coast, to the south the Suara Mountains and to the north the Gharian Mountains, the latter about 20 miles from the coast, having a width of from 12 to 15 miles and consisting for the most part of volcanic rocks and isolated peaks. In the southwestern and southern parts of Tripoli proper is the Hammada-el-Homra, an interminable stony tableland covering about 40,000 square miles and about 1,500 feet above sea-level, south of which is the Fezzan depression, in the oasis of which dwell tribes nominally subject to Tripoli, but practically independent. The eastern part of the country (Barca) is practically a continuation of the desert in the south, the mountains to the north being a continuation of the two ranges in Tripoli proper.

Fezzan.— This section of the country covers an area of about 150,200 square miles. In the northern part are low mountains or hills and sandy plains and a few fertile valleys are in the southern part. To the south, especially in the district surrounding the capital, Muzruk, are numerous oases, which together with the Valley of Wady Lajâl, form the most fertile section of Fezzan, corn and dates being cultivated in large quantities. The most common animals found in the hills are foxes, jackals, gazelles, the ostrich, vulture and falcon. There are no streams of water and but a few natural springs and small lakes, the rainfall being very slight and with long periods intervening.

Barca.— To the western and northern parts of this district, which is about 500 miles long by 400 miles wide, is the elevated plateau of Cyrenaica, which encloses the Gulf of Sidra and which is separated on the south from the Libyan Desert by the Aujila depression, a remarkable chain of low-lying oases. South of this depres-

sion the land gradually rises to a height of 1,200 feet and then again depresses to the level of the desert. The sides and summits of the hills in the east and north are well cultivated and afford excellent pasture.

Climate.— The climate is dry and warm, but healthful, droughts prevailing from May to September and rains from November to March.

Industries.— In the hilly districts a large portion of the land is left for grazing purposes and cattle-breeding has become an important branch of trade, but olives, figs, almonds and other fruits are cultivated to a considerable extent. The coast region in the extreme west, particularly the district of Mesheea, is a fertile fruit and cotton-raising district, the chief products of which are wheat, barley (the chief food of the people), millet, Indian corn, pomegranates, lemons, figs, jujubes, apricots, plums, watermelons, cotton, silk, tobacco, saffron, madder and castor-oil; while from the interior comes senna, dates and galls. Esparto-grass, barley and other grains, straw mats, earthen jars and other manufactures, beside the surplus products of the date and olive plantations, are exported by sea. The principal articles manufactured are carpets, cloaks, etc., sacking, prepared skins, morocco leather, earthenwares, etc. There is considerable trade by caravan with the Sudan, carrying European goods south, and ivory, ostrich feathers, rubber and gold north. The total value of the commerce is about $7,000,000 annually.

Government and Population.— Tripoli, which was until 1912 under the despotic rule of the sultan of Turkey, was then annexed by Italy and divided into two independent districts, Tripolitania and Cyrenaica, with their respective capitals at Tripoli and Benghazi, but in 1915 they were merged in one province and is ruled by a governor appointed by the king. There are courts of first and second instance and appeal. The revenues of the country are raised by direct tribute from the Arabs and district governors, a land tax, a tax on Jews and merchants and on export and import duties. The religion is Mohammedanism and while Arabic is generally spoken, Italian is the official language. The inhabitants are mostly Berber, but Jews are numerous, especially on the coast, Moors in the towns and nomadic Bedouins in the country. The population of Tripoli, including the dependencies, has been variously estimated at from 800,000 to 1,300,000. The town of Tripoli has a population of about 30,000; Benghazi of 35,000. Railways are under construction, over 300 kilometers having been laid.

History.— In ancient times Tripoli belonged successively to Carthage, Numidia and Rome. Later it passed into the hands of the Vandals and Greeks. It was captured in 644 by the Arabs, who turned the state religion from Christianity to Mohammedanism. The city of Tripoli was captured in 1510 by Ferdinand the Catholic and from 1530 to 1551 was under the control of the Knights of Saint John. In 1551 Tripoli became a Turkish province, then fell into a state of anarchy and remained a nest of pirates until in 1835 Turkey reasserted its authority and reduced what had been known as one of the «Barbary States» to a vilayet.

As a piratical stronghold Tripoli became involved with various European nations and finally with the United States. Both England and France sent expeditions against it in the latter part of the 18th century, and after numerous tributes and ransoms to insure peace had been paid by the United States to the «Barbary States» as a whole, a treaty with Tripoli was concluded in 1796 for peace without ransom. The pasha, however, inside of four years broke the treaty, demanding $225,000 and $25,000 annually, and on refusal of payment declared war 14 May 1801. An American squadron under Commodore Dale blockaded the harbor of Tripoli and under Commodore Preble (1803-04) bombarded the port five times. The city of Derme, in Barca, was also captured by General Eaton. Fearing further bombardment from the squadron and disaster by land, as well as disaffection and insurrection among his own troops, the pasha signed a treaty of peace on 3 June 1805. In 1815 Decatur forced the pasha to release all ships and prisoners of whatever nation which he had seized and also to pay all indemnities on pain of having the city destroyed. Since that time several rebellions have occurred, the most notable taking place in 1842 and 1844, but all have been successfully suppressed by the Turkish government. In September 1911 war broke out between Italy and Turkey and an Italian army of invasion occupied the country. On 5 November Italy decreed its annexation; but the struggle continued until 18 Oct. 1912, when by the Treaty of Ouchy, Turkey consented to abrogate her sovereignty and the annexation has been recognized by the great powers. See BARBARY; BARBARY POWERS, UNITED STATES TREATIES AND WARS WITH THE; BARCA; FEZZAN; TURKO-ITALIAN WAR.

TRIPOLI, TRIPOLIS, or TARABULUS, Syria, Asiatic Turkey, a town in the vilayet of Beirut, about 40 miles north-northeast of the city of Beirut and two and a half miles from El-Mina, its port of entry. It is situated at the foot of a spur of Mount Lebanon and at the mouth of the Kadisha. The ancient town was situated on a triangular promontory jutting out into the Mediterranean Sea, and for several centuries continued to occupy that position. Earthquakes destroyed a greater portion of the town in 450 and again in 550; in 638 it was captured by the Saracens; it became an important stronghold at the time of the Crusades, and in 1108 was captured by the Crusaders, after having successfully withstood a siege lasting several years. At that time a large and valuable library was burned. It was destroyed by the Egyptian sultan, Kalaun, in 1289, but soon afterward the town was rebuilt on its present site and now enjoys considerable prosperity. In May 1864 the government powder magazine exploded, destroying a large portion of the town and 300 or 400 lives. Among the buildings are a custom-house, foreign consulates, churches, a synagogue, several mosques, an American mission station and girls' school, an orphanage and girls' home of the French Sisters of Charity, a monastery, and an old castle standing on an adjacent height. The main source of income is derived from the export of raw silk, sponges, ivory, sugarcane, olive-oil, cotton, wool, ostrich feathers, tobacco, galls, cochineal, soap, etc. Pop. about 30,000, mostly Mussulmans.

TRIPOLI, a porous, silicious rock, probably formed by the weathering and leaching of chert beds. It occurs abundantly in Missouri, southern Illinois and western Tennessee. The tripoli usually consists of over 98 per cent of silica (SiO_2). Large blocks are used for filter stones. The finer material is ground into tripoli flour, used largely in scouring and polishing preparations. The term tripoli is incorrectly used for tripolite (q.v.) or diatomaceous earth.

TRIPOLI AND INFUSORIAL EARTH. See MINERAL PRODUCTION OF THE UNITED STATES.

TRIPOLITAN WAR, in American history, the name applied to a war between the United States and Tripoli in 1801–05. It was caused by the refusal of the United States to increase its payment for immunity from the depredations of the Tripolitan corsairs. After several engagements peace was concluded 4 June 1805.

TRIPOLITE, a name applied to a silicious ooze composed chiefly of silicious shells of diatoms and hence often called diatomaceous earth or wrongly infusorial earth. It resembles clay or chalk, but is a little harsh between the fingers and scratches glass. It often forms thick deposits below peat swamps. In the Miocene beds of the Atlantic Coast is a more or less impure diatomaceous deposit over 200 feet in thickness. Not to be confused with tripoli. See TERTIARY; DIATOMS.

TRIPOS, a term applied in Cambridge University, England, to the list of successful candidates for honors in the final examinations of the different departments of the university; also the honor examination. The word is supposed to be derived from the fact that the candidate for honors formerly sat on a three-legged stool (tripod or tripos) during his disputation with the professor.

TRIPP, Bartlett, American diplomatist: b. Harmony, Me., 15 July 1842. He was graduated at Waterville College (now Colby University) in 1861 and completed a law course at Albany in 1866. He practised first at Augusta, Me., but in the spring of 1869 removed to Yankton, Dak. In 1877 he served on the commission appointed to revise and codify the laws of Dakota and was president of the first convention that drafted a constitution for the new State of South Dakota. During 1885–89 he was chief justice of the Territory and in 1893 was appointed United States Minister to Austria. Returning from his diplomatic post in 1897, he was, two years later, appointed chairman of the commission having in charge the settlement of complications arising between England, Germany and America over the affairs of Samoa.

TRIPTOLEMUS, trĭp-tŏl'ĕ-mŭs, in the Greek myth, the son of Celeus, king of Attica, and of Metaneira. The goddess Ceres loved him and wished to make him immortal, but was prevented through the meddling curiosity of his mother. She, however, taught him plowing and agriculture and instructed him how to sow corn and make bread. She also gave him her chariot, drawn by two dragons, in which he traveled over the earth and distributed corn to all the inhabitants of the world. He is the hero of the Eleusinian mysteries and founder of the Thesmophorian celebration. In the Attic Eleusinian fable he is represented as the judge of the dead.

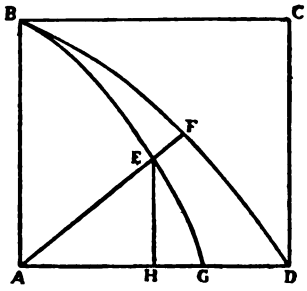
TRIPTYCH, trĭp'tĭk, *in art,* a picture, carving or other representation in three compartments side by side; most frequently such as is used for an altar-piece. The central picture is usually complete in itself and the designs on either side smaller.

TRIREME, *in classical antiquity,* a large galley or war-vessel with three benches or banks of oars on a side, a common class of warship among the Greeks, Romans, Carthaginians, etc. The trireme was usually provided with a large square sail, which could be raised during a fair wind to relieve the rowers, but was not employed in action.

TRISACRAMENTARIAN, a name given to those Lutherans and other Protestants who maintained that the sacraments of Baptism, the Lord's Supper and Penance were necessary to salvation. This opinion was held by some Lutherans at Leipzig and was advocated in England in the "Institution of a Christian Man," published in 1536.

TRISAGION. See DOXOLOGY.

TRISECTION OF AN ANGLE (from Lat. *tresectus,* cut in three parts), a famous problem in mathematics. It was first investigated by the Sophists and Hippias of this school invented the quadratrix by which any angle



may be trisected. In the figure let BD be the quadrant of a circle, BG be the arc of the quadratrix and the construction involve the relation $\frac{DB}{FD} = \frac{BA}{EH}$. Then by dividing B A into segments having any given ratio, the quadrant or any arc BD can be divided into arcs having the same ratio.

TRISMEGISTUS. See HERMES TRISMEGISTUS.

TRISMUS NASCENTIUM (Lat., lockjaw of the newborn), a form of lockjaw, usually fatal, occurring in children a few days after birth. See TETANUS.

TRISSINO, Giovanni Giorgio, jō-vän'nē jōr'jō trēs-sē'nō, Italian author: b. Vicenza, 18 June 1478; d. Rome, 8 Dec. 1550. He studied the Greek language under Chalcondylas and became also a graceful Latin and Italian writer. At a mature age he was employed by Popes Leo X and Clement VII upon several diplomatic missions. He wrote 'Sofonisba,' the first Italian regular tragedy; 'L'Italia Liberata dai Goti,' an epic in blank verse; and 'La Poetica,' a treatise on poetical art. To his suggestion is attributed the present method of

writing the *v* and *j* of the Roman alphabet different from the *u* and *i* with which they were before confounded. He also endeavored to introduce distinct signs for the different sounds of *o* and *e*.

TRIST, Nicholas Philip, American lawyer and diplomatist: b. Charlottesville, Va., 1800; d. 1874. He studied at West Point but left the Military Academy without graduating; studied law with Thomas Jefferson; in 1824 took a clerkship in the United States Treasury Department and in 1829 became private secretary to President Jackson. He was consul at Havana in 1834–36 and in 1845 was made chief clerk in the Department of State. On 15 April 1847 President Polk appointed him special agent to negotiate a peace with Mexico, American successes having practically determined the result of the war with that country. (See MEXICAN WAR, THE). A quarrel with General Scott hindered the performance of his mission and his efforts were unavailing until the new government succeeded that of Santa Ana. Meanwhile Trist's commission had been canceled; but having become reconciled with Scott, he followed his counsel and continued the negotiations, which resulted in the Treaty of Guadalupe-Hidalgo (q.v.).

TRISTAN, TRISTRAM or **TRISTREM,** the central figure of a circle of Celtic myths, which with modifications subsequently appeared in all European literatures. See ARTHURIAN ROMANCES; MORTE D'ARTHUR; TRISTAN.

TRISTAN, a courtly epic written by the Middle High German poet Gottfried von Strasburg about 1210. Like most courtly German epics it is a free rendering of a French source, in this case that of the *trouvère* Thomas of Brittany, the master of the *aventiure,* as Gottfried calls him. It tells the story of a pair of unfortunate lovers, Tristan and Isolt, who are constrained by a love potion to love one another against their will. 'Tristan' belongs to the Bretonic cycle of sagas and reflects the struggles between the Bretons of Cornwall and the Viking kingdom of Ireland. The earliest version is that of the Norman minstrel Berol, which was translated into German by Eilhart von Oberge about 1170. Gottfried knew this version but considered that of Thomas to be more accurate. This version of Thomas appears also in the form of a Norwegian prose saga about 1226 and of an English poem, 'Sir Tristrem,' about 1300.

As Gottfried tells the story, Tristan was the child of Riwalin of Parmenie and Blanchefluer, sister of King Mark of Cornwall. His parents died early, his mother in giving him birth, and he was brought up by a faithful vassal named Rual, who taught him many languages and trained him in all knightly arts. When the lad was 15 he was abducted by Norwegian traders and landed on the coast of Cornwall, where he was taken to his uncle's court, although neither was aware of the relationship. Here he soon became a favorite and was made a knight. Later he fatally wounded the giant Morolt, who had been sent by the king of Ireland to collect tribute long overdue. A splinter of Tristan's sword remained in Morolt's skull. Tristan himself was wounded, and, as his wound would not yield to treatment, he set out disguised as a minstrel to the court of Queen Isolt of Ireland, who was famous for her healing arts, but whose brother Morolt he had slain. Here he was healed by the queen and spent sometime instructing her daughter Isolt in the art of music. On his return he praised the beauty of the fair princess so highly that King Mark was persuaded to make her his bride. Tristan is sent as the messenger, succeeds in ridding the land of a fell dragon, and receives as his reward the hand of the king's daughter, which, however, he claims for his uncle and not for himself. Meanwhile he is recognized as the slayer of Morolt by the missing splinter in his sword, but paints the advantages of a union with King Mark in such glowing colors that he succeeds in reconciling the relatives of the dead giant. On the voyage to Cornwall, Isolt and Tristan, through a mistake of the maid Brangaene, drink of a love potion prepared by Queen Isolt for her daughter and King Mark. For a time the two young people struggle bravely against the overpowering passion which steals over them, but finally abandon themselves to the enjoyment of their love. Instead of confessing their secret to King Mark, they conceal it, and after Isolt becomes the king's bride, continue their clandestine meetings. Again and again they are suspected and are finally caught, but Isolt succeeds in clearing herself by a trick at the trial which is held to decide the question of her guilt. Again detected in a meeting, Tristan is banished and goes to Arundel, where he marries a second Isolt, Isolt "of the white hands"; but because of his love for the first Isolt he lives with the latter in chastity. Here Gottfried's poem breaks off. It was continued and finished by two other poets, Ulrich von Türheim, a Swabian, and Heinrich von Freiberg, a Saxon, who relate how Tristan, once again wounded, sends for his love Isolt. She hastens to his side, but his wife Isolt, prompted by jealousy, declares that the vessel carries a black sail instead of the white one agreed on if Isolt were coming. Tristan succumbs to the shock and Isolt on landing throws herself on the body of her dead lover and dies of a broken heart.

The poem is justly famous among mediæval epics for its wonderful psychological analysis, its masterly portrayal of the struggles of the two lovers against their ill-fated love and the beauty and limpidity of the verse. It is very long, nearly 20,000 lines, but it does not weary us, as do many courtly epics, with lengthy descriptions of armor and dress. The best editions are those of Bechstein (two vols., 3d ed., 1890), W. Golther (Stuttgart 1889) and K. Marold (Leipzig 1906). It has been translated into modern German by H. Kurz (1844), by Karl Simrock (1855); but finest of all is a free rendering by W. Hertz (5th ed., 1911). An English prose translation has been made by Jessie L. Weston (1899). Matthew Arnold modernized it under the title of 'Tristram and Iseult' and Swinburne unblished in 1882 his 'Tristram of Lyonesse,' the best modern epic version of the old saga. Many German modernizations exist, among the most important of which are the epic by Karl Immermann (1840) and Richard Wagner's beautiful music drama 'Tristan and Isolde' (1850). Consult Golther, W., 'Tristran und Isolde in

Dichtungen des Mittelalters und der Neuen Zeit' (Leipzig 1907).

D. B. SHUMWAY.

TRISTAN DA CUNHA, trĭs-tăn' dä koon' yä, or **D'ACUNHA,** a group of three small islands in the south Atlantic Ocean, belonging to Great Britain, and situated in lat. 37° 6' S., and long. 12° 2' W., about 2,000 miles west of Cape Town and 3,000 miles east of Bahia Blanca, on the South American Coast, probably the most isolated inhabited spots on the globe. The islands are named Tristan, Nightingale and Inaccessible. They are peaks of sunken mountains, for nearby soundings go below 6,000 feet and not far away to 12,000 or more. The principal and only inhabited member of the group, Tristan, is 16 square miles in area. It is an extinct volcano rising almost abruptly to a height of 8,200 feet. There is a fine stream and a fresh-water lake. The first permanent settlement was in 1810 and the population is now about 100. The people are moral and hospitable.' The climate is mild, but wet. Cattle, sheep and vegetables are raised. The island was discovered by the Portuguese navigator Tristan da Cunha in 1506 and in 1817 was taken possession of by Great Britain. Pop. about 100.

TRISTEARIN. See STEARIC ACID.

TRISTRAM, Henry Baker, British clergyman and writer: b. Eglingham, 1822; d. 1906. Educated at Lincoln College, Oxford, he became rural dean of Durham (1880) and traveled extensively thereafter. Among his more noted writings are 'The Land of Israel' (1865; 2d ed., 1882); 'Natural History of the Bible' (1867; 5th ed., 1880); 'The Land of Moab' (1873; 2d ed., 1874); 'Eastern Customs in Bible Lands' (1894), etc.

TRISTRAM SHANDY. 'The Life and Opinions of Tristram Shandy, Gentleman,' by the Rev. Laurence Sterne (1713–68), one of the most famous masterpieces in English fiction, was begun in 1759 by way of relieving the author's mind during his wife's attack of insanity. The first instalment was refused by Dodsley in the autumn of 1759 and was privately published by the author in 1761. It had such instant success that a second edition was published in April. Succeeding volumes followed rapidly, the sixth volume appearing in December 1761, but thereafter there were longer intervals, the ninth and last volume being completed late in 1766 (published in 1767), on Sterne's return from a trip through France and Italy, which gave him material for 'A Sentimental Journey.'

In spite of, perhaps because of, its popularity, 'Tristram Shandy' received, as it has since continued to receive, much adverse criticism. This was based on the minor grounds of formlessness and lack of definiteness and realistic sense and for the more important reasons of alleged indecency. Dr. Johnson condemned it for the latter fault and it was also made the subject of burlesque and irony. Sterne, however, continued writing in his own vein and was rewarded with immediate and permanent reputation as an original humorist of high rank. With Richardson, Fielding and Smollett he is usually regarded as one of the four great novelists of the 18th century.

'Tristram' remains one of the most difficult of books to describe. Generally speaking, it belongs to the discursive, digressive, rambling, *intime* kind of novel best represented by Rabelais and Cervantes, to whom Sterne constantly makes acknowledgment, and it is doubtless the prototype of such modern and more decorous novels of the whimsical kind as 'The Autocrat at the Breakfast Table.' It is, however, unlike its originals, in that it apparently lacks the general and satirical purpose that modern critics have discerned in Rabelais and Cervantes, and because its picaresque type of adventure is almost always mental rather than physical. It is an account of the humors of odd people of vivid personality and ways of mind and it is replete with the wit and humor of special situations, persons and habits. It is the vehicle for Sterne's wit, sentiment, whims, humor, learning and notions about various particular things. So far as the author expressed his purpose, such passages as the following tell what he is trying to do: "'Tis to rebuke a vicious taste, which has crept into thousands besides herself — of reading straight forwards, more in quest of the adventures than of the deep erudition and knowledge which a book of this cast, if read over as it should be, would infallibly impart with them. The mind should be accustomed to make wise reflections and draw curious conclusions as it goes along." (Ch. 20). "My work is digressive and it is progressive too — and at the same time." (Ch. 22). "Writing, when properly managed (as you may be sure I think mine is), is but a different name for conversation. As no one who knows what he is about in good company, would venture to talk all — so no author who understands the just boundaries of decorum and good breeding would presume to think all: the truest respect which you can pay to the reader's understanding is to half the matter amicably and leave him something to imagine, in his turn as well as yourself." (Ch. 36).

More concretely, the characters are the important thing. Only 10 figure directly in this long novel. Walter Shandy, merchant; his wife; his brother, the immortal Uncle Toby; the latter's servant, Corporal Trim; Dr. Slop; Yorick, the parson; Obadiah, the manservant; Susannah, the maid servant; the Widow Wadman, Toby's inamorata; and Bridget, her maid; besides Tristram, the showmaster. Numerous lay figures, Didius, Kysarcius, Phutatorius and others, are named from time to time to set off these principal characters, but they never actually appear; and there are many illustrative and digressive stories, as that of the nose and the excellent episode of Le Fever. Nearly half the book is taken up with the prenatal surroundings of Tristram,— of the Shandy family the articles of marriage settlement, the local *accoucheurs,* and other such matters, and of these, the discourses of Mr. Shandy, Uncle Toby, and Dr. Slop, while awaiting the birth of the hero, form a large part. Uncle Toby, the most famous character in the book and one of the most enjoyable creations in literature, is characteristically described by his hobby-horse, playing at fortification and the art of besieging towns. He responds chiefly to such ideas; and yet such is Sterne's art that Toby remains immortal for his simple and generous nature. 'Tristram' is practically without story

or plot, the only connected episode being that about the middle of the novel the hero is born with a broken nose and is misnamed Tristram, to the great grief of his father. Otherwise it is all quiddity, disgression, eccentricity and interlude. Of the three hundred odd chapters, some have only a line or two, and no one chapter may be said directly to follow its predecessor. Consult the 'Life of Laurence Sterne' by Percy Fitzgerald, the biographical criticism by Paul Stapfer and H. D. Traill in the 'English Men of Letters' series, as well as the usual histories of English literature and the 18th century.

WILLIAM T. BREWSTER.

TRITHEISM, the doctrine that there are three Gods, instead of three Persons in the Godhead. It has been taught both in the early Christian period, and in recent times, although so far as known to the public it has no present advocates. The Gnostics, according to Cyril of Jerusalem, were the first to teach it. A similar doctrine was formulated in the 6th century by Ascugnages of Constantinople, after whom one of his pupils, Philoponus, founded a tritheistic sect, which was followed by another sect called Cononites. Tritheism seems to have been dead or dormant for several centuries, until Rosellinus, in the 11th century, brought it forward in a novel form. He taught that the name of God was the abstract idea of a genus containing the three Persons, the Father, the Son and the Holy Ghost. Having been condemned by the Council of Soissons in 1092 he recanted. Tritheism was not heard of again until 1691, when Dr. Sherlock, Dean ot Saint Paul's, London, maintained that "there are three infinite and distinct minds and substances in the Trinity." This teaching was condemned by the heads of the houses at Oxford, as "false, impious and heretical," and the controversy which followed was suppressed by an order in council.

TRITHEMIUS, Johannes, German Catholic theologian and historian: b. at Trittenheim near Treves, 1462; d. at Würzburg, 1516. He was christened Heidenberg but was called after his birthplace. He entered the Benedictine monastery at Sponheim and became its abbot (1483) but his strict rule made him unpopular and he exchanged for the monastery of Saint James at Würzburg. Of his numerous writings his letters were published in 1536 and his sermons in 1576. He was a pioneer author in German church history. Consult Janssen, Johannes, 'History of the German People at the Close of the Middle Ages' (Eng. trans. by A.M. Christie, London, 1896).

TRITICUM, a genus of grasses (q.v.), one species of which (*T. vulgare*) is wheat (q.v.). See GRASSES IN THE UNITED STATES.

TRITOMA, a florist's name for a genus (*Kniphofia*) of African plants of the family *Liliaceæ,* one of which (*K. aloides*) is also widely known as flame-flower, red-hot-poker-plant, torch-lily, etc., and is planted among shrubbery that needs an enlivening color between midsummer and the coming of frost. The "bulbs" send up long, narrow, radical leaves from among which the rocket-like spikes of flamboyant red flowers rise four or more feet. North of Washington the plants are usually taken up and stored during the winter, and in places where the ground is likely to freeze and thaw alternately they should be mulched. They succeed well in any well-drained, warm, loamy soil well protected from wind. Ordinary care in cultivation and fertilizing is sufficient. This species has a score or more of named varieties.

TRITON, trī'tŏn, *in Greek mythology,* son of Poseidon and Amphitrite, with whom he lived in a golden palace at the bottom of the sea. The Triton Sea, a fabled ocean in Africa, appears to be his haunt in the Argonaut cycle. He is variously described, but his body is generally a compound of the human figure above with that of a dolphin below. He is also horned and prick-eared as if an ocean satyr. He carries a large shell, which serves him as a horn on which he blows loudly to rouse the waves, or softly to assuage their fury. Numerous tritons sometimes appear, creatures who in addition to the torso of a man and the tail of a dolphin prance through the billows with the forefeet of a horse. A most beautiful example of this conception is the 'Triton and Nereid' of the Vatican, in which Triton amid a group of sportive Cupids is carrying off a Nereid. Consult Escher, 'Triton, und seine Bekämpfung durch Herakles' (1890); Brunn, 'Griechische Götterideale' (1893).

TRITON. See TRUMPET-SHELL.

TRITYLODON (from the Greek, meaning "three knotted teeth"). A mammal from the lower Jurassic of South Africa; primitive and multituberculate, seemingly resembling the cynodont reptiles with which it has been classed.

TRIUMPH, a solemn procession granted to a victorious general of ancient Rome. It was bestowed only on one who had held the office of dictator, consul, or prætor, and after a decisive victory over foreign foes, or on the complete subjugation of a province. On the day of the triumph all the temples were thrown open; every shrine was decorated with garlands, and every altar smoked with incense. The general assembled his soldiers without the city, delivered to them a commendatory oration, and distributed rewards and money as their share of the spoil of the enemies. He then mounted his car and advanced to the triumphal gate (*porta triumphalis*), where he was met by the senate, and the procession was formed and marched along the Via Sacra to the Capitol. It was led by the senate, headed by the magistrates, and included a train of carriages laden with spoils — models of captured forts and cities, pictures of the country conquered, trumpeters and flute-players, white bulls or oxen destined for sacrifice, attended by priests with their insignia and implements; the most distinguished captives, etc. The triumphant general rode in a circular chariot drawn by four horses; in his right hand he bore a laurel bough, and in his left a sceptre; he was attired in gold-embroidered robe and a flowered tunic, and his brows were encircled with laurel. In the car he was accompanied by his children of tender age, and sometimes by very intimate friends. A public slave held over his head a gold Etruscan crown ornamented with jewels. The legates, tribunes and equestrians, with the grown-up sons of the conqueror, followed on horseback. The infantry followed

in marching order, their spears adorned with laurel, shouting, *Io triumphe!* singing hymns to the gods, and praising or ridiculing their general, according to the license of the day, as their humor might dictate. As the procession ascended the Capitoline Hill some of the captives were withdrawn from it and conducted to prison to be put to death. As soon as their execution was intimated the victims were sacrificed, offerings presented to Jupiter, and the general and his friends parted in the temple, returning home in the evening accompanied by flutes and torches and a crowd of citizens. Sometimes when the spoil was great the procession extended over more than one day. The *ovation* was a lesser triumph, so called because the sacrifice on the occasion was a sheep. The general entered the city on foot, and was not attended by the senate. He was preceded by flutes, but not by trumpeters, and was not necessarily accompanied by his army. Consult Mommsen, 'Romisches Staatsrecht' (1887).

TRIUMPHAL ARCH. See ARCH, MEMORIAL AND TRIUMPHAL.

TRIUMVIR, in ancient Rome, one of the three men united in office. The triumvirs were either ordinary magistrates (as the *triumviri capitales*, who were police commissioners, having charge of the jails, and acting as magistrates, the *triumviri monetales*, who were commissioners of the mint, and had the charge of coining money), or they were extraordinary commissioners appointed to jointly execute any office. The term is specifically applied to the members of the two triumvirates. See TRIUMVIRATE.

TRIUMVIRATE, an office administered by three men (*triumviri*). When Cæsar was murdered, Antony, Octavius and Lepidus received power to restore order in the state: they were called *triumviri reipublicæ constituendæ*, and their office the triumvirate. The coalition between Cæsar, Pompey and Crassus is also called a triumvirate, but it was merely a union or conspiracy of three private citizens without the public sanction. See ROME.

TRIVANDRUM, trē-vän'droom, **TRIVANDRAM,** or **TRIUVANANTAPURAM,** India, the capital of the native state of Travancore, situated on the west coast near the southern extremity of India. It has two colleges, good schools and hospitals, also a fine modern palace of the raja, and on the outskirts are a fort, a military cantonment and an observatory. It is connected by a canal with the port of Quillon. Pop. 63,561.

TRIVET (or TREVET), Nicholas. Early English historical writer: b. about 1258; d. about 1328. He wrote extensively, but is chiefly known for his 'Annales' which was edited by Hog for the English Historical Society (1845). This chronicle history of the Angivins is particularly valuable for the reign of Edward I.

TRIVIUM, the name given in the Middle Ages to the first three of the seven liberal arts — grammar, rhetoric and logic. The other four, consisting of arithmetic, music, geometry and astronomy, were called the *quadrivium*.

TROBRIAND, Philippe Regis, BARON DE, French soldier and writer: b. Tours, France, 4 June 1816; d. 1897. He was educated in Paris and elsewhere abroad and came to America in 1841. He was editor (1854–61) of the *Courier des Etats-Unis*. In 1861 he entered the Federal army, playing an important part in the battles of Fredericksburg and Gettysburg and becoming a brigadier-general (1864). He was brevetted a major-general (1865) and later was commissioned a colonel in the regular army. He afterward commanded the districts of Dakota, Montana and Green River. In 1879 he retired. He published a novel and an historical work on the campaigns of the army of the Potomac. Consult Post, M. C. (his daughter), 'The Life and Memoirs of Compte Régis de Trobriand' (New York 1910).

TROCADÉRO. An elevated place opposite the Pont d'Iéna, on the right bank of the Seine. It was named after a Spanish fort near Cadiz captured by the French in 1823. It was used for the exhibitions of 1867 and 1878, for the latter year being laid out as the Palais du Trocadéro. The buildings contain a great concert hall with two towers and in the wings a fine museum.

TROCAR, a surgical instrument consisting of a sharp-pointed rod sliding in a canula or tube, and used in the operation of tapping, or the puncturing of a cavity to drain off fluid. The rod projects a little beyond the canula, and is withdrawn after the combined instrument has been thrust in. Duchenne's trocar is an instrument for removing small portions of tissue from deep parts for the purpose of microscopic study. Durham's or the piloting trocar is a guide for the introduction of a jointed tracheotomy-tube. Aspirating trocars are usually supplied with a stop-cock.

TROCHEE (Lat. *trochæus*, Greek τροχαῖος), in Greek and Latin verse, the name given to a measure, or foot, which consists of a long and a short syllable. See VERSIFICATION.

TROCHELMINTHES, a division of worms, containing a comparatively small number of minute aquatic organisms, characterized by having that larval form denominated a trochophore (see LARVA). It is principally composed of a single class, the *Rotifera* (q.v.), plus two other groups of microscopic and little known marine "worms," the *Dinophilea* and the *Gastrotricha*. Consult Parker and Haswell, 'Zoology' (New York 1910).

TROCHES. A lozenge-shaped pastile containing usually a medicinal substance put up with sugar and mucilage and flavored. They are dissolved in the mouth and are used to act on the throat. The United States Pharmacopœia recognize nine official troches. Ammonium chloride, cubeb, gambir, krameria, liquorice and opium, potassium chlorate, santonin, sodium bicarbonate and tannic acid.

TROCHILIDÆ, the family of the hummingbirds (q.v.).

TROCHOID, *in mathematics* is the path that any point of a circle moving along a plane, and around its centre, traces in the air; so that a nail in the rim of a cartwheel moves in a trochoid, as the cart goes along, and the wheel itself both turns around its axle and is carried along the ground. The word trochoid is derived from the Greek τροχός, from τρεχω run, and εἶδος shape. In mathematical parlance,

the word trochoid conveys the same idea as the word cycloid.

Few curves have afforded finer scope for exercise of modern geometry than the trochoid or cycloid (q.v.). Its properties successively engaged the attention of Roberval, Fernat, Descartes, Pascal, Slusius, Wren, Wallace and Huygens. Huygens rectified this curve as early as 1657; and having afterward discovered the isochronism, or its remarkable property that all bodies along it will descend from any point in the same time and likewise that it produces a similar trochoid by its development, he applied the discoveries to the improvement of the pendulum, and showed how perfectly synchronous vibrations could be procured, theoretically at least, by causing a flexible rod to vibrate between the trochoidal cheeks. Upon this geometrical curve, then, depends the better part of the whole doctrine of pendulums. Huygens demonstrated that from whatever point or height a heavy body oscillating on a fixed centre begins to descend, while it continues to move in a trochoid (or cycloid) the times of its falls or oscillations will be equal to each other. It is likewise the curve of quickest descent — that is, a body falling in it from any given point above to another not exactly beneath it will come to this point in less time than in any other curve passing through those two points. This very singular property of the trochoid with respect to motion was first discovered by one of the Bernouillis in 1697. From this it is easily seen that if any body whatever move in a trochoid by its own weight or swing together with some other force acting upon it all the while, it will go through all the distances of the same curve in exactly the same time, and accordingly pendulums have sometimes been contrived to swing in such a manner that they shall describe trochoids, or near trochoids, and thus move in equal times whether they go through a longer or shorter path of the same curve.

As the curve of quickest descent, the trochoid is understood to assume its inverted position. It is to be noticed that although the trochoid is longer than many curves and the straight line that may connect two points not in the same verticle line, yet it is, of all lines which can be drawn, the one through which a body will fall in the shortest time. John Bernouilli made the enquiry after the curve which possesses the property: "That a body setting out from any point of it, as A, and impelled solely by the force of gravity, will reach another point of it, as B, in a shorter space of time than it could reach the same point by following any other path." To this curve he gave the name brachystochrone, from *βράχιστος* shortest, and *χρονος* time. It is plain from what has been said about the curve of quickest descent alone, that the brachystochrone and the trochoid (or cycloid) are one and the same curve.

This curve possesses an additional historical interest entirely independent of the particular nature of the curve, for the determination of the nature of this line suggested to Lagrange the idea of an entirely new branch of mathematics, the calculus of variations.

The trochoid (or cycloid, under which name the brachystochrone is best known) may be made to assume an endless variety of forms by placing the tracing point *not in* the circumference of the generating circle but *without* or *within it*. The meaning in this article of a curve is the totality of points, whose co-ordinates are functions of a parameter which may be differentiated as often as may be required. Consult Klein, H., 'Elementar Mathematik vom böheren Standpunkte aus' (Leipzig 1909, Vol. II, p. 354).

If the generating point lies upon the circumference of the generating circle, the curve is known as a common trochoid or a cycloid. When the point is without the circumference of the generating circle, the resulting curve is called curtate or contracted. If the point of generation lies within the circumference of the generating circle, the curve is called a prolate or inflected trochoid or cycloid. In all three instances the wheel or generating circle is thought of as rolling along a straight line in a single plane. For trochoids otherwise conditioned by the surface over which the wheel can roll see ROULETTE; HYPOCYCLOID; CYCLOID.

One more fact in connection with this interesting curve may be noted: It is believed by some that birds, such as the eagle, which build in the rocks, drop or fly down from height to height in this curve. It is impossible to make very accurate observations of their flight and path, but there is a general resemblance between it and the trochoid or cycloid, which has led several ingenious men to adopt this opinion. With the further development of photographic observation, this hypothesis may be confirmed or abandoned.

TROCHOSPHERE, a form of larva (q.v.), especially characterizing the *Trochelminthes* (q.v.), but also seen in other of the lower invertebrates. It is a microscopic oval body, with a mouth, short alimentary canal, and anal opening at the lesser end. There is slight evidence of sense organs. Consult Parker and Haswell, 'Text Book of Zoology' (1910).

TROCHU, trō-shü, **Louis Jules**, French soldier: b. Belle Isle, department of Morbihan, 12 May, 1815; d. Tours, 7 Oct. 1896. He was educated at the school of Saint Cyr, entered the army at an early age, and in 1840 was attached to the general staff with the rank of lieutenant. Sent to Algeria in 1846, he was made adjutant to Marshal Bugéaud and after some years of service in the ministry of war, acted in the same capacity with Marshals Canrobert and Saint Arnaud in the Crimea, gaining special distinction in the storming of the Malakoff bastian at Sevastopol. He fought against Austria in 1859 doing excellent service at Solferino, where he held the rank of general of division. Once more in the Ministry of War and in favor with the government, he made himself *persona non grata* by the publication of his 'L'Armée française en 1867,' in which the deplorable conditions prevailing in the army were ruthlessly pointed out and a reorganization of the national forces on the German model was urged. After the outbreak of war with Germany he was made governor of Paris, but placed himself in opposition to the empire, and after the proclamation of the republic, 4 September, became president of the government of national defense, retaining at the same time his office of governor of the capital. In his defense of the city against

the besieging German army he displayed a half-heartedness which his enemies ascribed to timidity, but which was due to his conviction of the hopelessness of resistance. He resigned the governorship a few days before the capitulation of the city, but remained at the head of the provisional government till the meeting of the National Assembly. In his defense he published, 'L'empire et la défense de Paris devant le jury de la Seine' (1872); 'Pour la vérité et pour la justice' (1873); 'La politique et le siège de Paris' (1874).

TROCHUS. See TOP-SHELLS.

TROGLODYTES, the prehistoric cave-dwelling men of Western Europe, Asia, Æthiopia, Egypt, etc. The name is sometimes extended to any savages living in caves. See CAVE-DWELLERS.

TROGON, a bird of the family *Trogonidæ*, of the order *Coraciiformes* or *Coccygomorphæ*, and unique in the structure of the feet, in which the first and second toes are directed backward and the third and fourth forward, whereas in all other yoke-toed birds the first and fourth toes are directed backward. The bill is short, strong and of wide gape; the tail generally long and in some species very long; the feet small and often feathered almost to the toes. They form a well-marked family of insectivorous and frugivorous forest-haunting birds of small size, whose dense, puffy plumage exhibits the most exquisite tints of pink, crimson, orange, brown or metallic green, often relieved by delicate bands of pure white. In one Guatemalan species (*Pharomacrus mocinno*), the long-tailed trogon or quetzal, the tail-coverts of the male are enormously lengthened into waving plumes of rich metalic blue-green, as graceful and marvelous as those of the birds of paradise. This is the "national bird" of Guatemala, a distinction which it owes to its ancient association with the great Mexican deity Quetzalcoatl (q.v.).

Trogons are unable to use their feet for climbing, and usually take their station on the branches of a tree, dashing on insects as they fly past, or on some fruit at a little distance from them, and returning to their seat to eat what they have secured. The family includes about 10 genera and 50 species, which abound in tropical America with a few representatives in Africa and the Oriental region. A single species, the coppery-tailed trogon (*Trogon ambiguus*), just enters the United States from Mexico. It is a magnificent metallic golden-green bird less than a foot in length which nests in holes in trees and feeds upon fruits, insects, small lizards, etc. Consult Gould, 'Monograph of the Trogonidæ' (London 1875); Godman and Salvin, 'Biologia Americana-Centrali' (London 1896).

TROILUS (tro'ĭl-ŭs) **AND CRESSIDA,** (1) A poem by Geoffrey Chaucer, written about 1369 and adapted from Boccaccio's 'Filostrato.' (See TROILUS AND CRISEYDE). (2) A play composed by Thomas Dekker and Henry Chettle, and first acted in 1599. (3) A tragedy by Shakespeare. (4) A play by Dryden printed in 1678.

TROILUS AND CRESSIDA. 'Troilus and Cressida' is probably Shakespeare's most puzzling play. There is a still unsolved mystery about its appearance in the Folio of 1623: it is not mentioned in the prefatory 'Catalogue' of plays contained in this volume, but appears with pages irregularly numbered at the end of the section devoted to histories and before the first tragedy, 'Coriolanus.' A quarto edition, differentiated by two varying title-pages both claiming Shakespeare as author, appeared in 1609; but as early as 7 Feb. 1603, James Roberts had secured a license to publish "The Booke of Troilus and Cressida, as yt is acted by My Lord Chamberlen's men," "when he hathe gotten sufficient authority for yt." Sufficient authority was apparently not obtainable, but the record establishes the date of the play, which is confirmed by an allusion in its prologue to Jonson's 'Poetaster,' known to have been acted in 1601. 'Troilus and Cressida' is thus contemporaneous with 'Hamlet,' and its obscurities, like those of the other play, may be due to its bearing upon the "War of the Theatres" controversy of 1601. Efforts to interpret the play along these lines have, however, been particularly unsatisfactory, though it may perhaps be accepted that the pompous Ajax is a travesty of Ben Jonson. The dissimilarity of 'Troilus and Cressida' to Shakespeare's other work can be overstressed. From the first the poet displays a quality which might make trouble for a romantic dramatist: a mischievous tendency to splash his tender creatures of romance with the salt douche of cynical realism. In 'Love's Labor's Lost' and 'Henry IV' this produces only a pleasurable tingle, in 'Troilus' a decided chill. What most shocks the reader of the present play is the apparent irreverence to Chaucer and to Homer, but neither of these can have been to Shakespeare a particularly holy name. From Chaucer he derived the love story of 'Troilus and Cressida,' a story unknown to the ancients; but Shakespeare was not, as Spenser was, sufficiently antiquarian in his tastes to attain any real appreciation of Chaucer. Homer was probably first made known to the dramatist in Chapman's translation of seven books of the Iliad, published a year or two before this play was produced. The first looking into Chapman's Homer aroused in Shakespeare inspiration far different from that of Keats. He saw in the then fragmentary work not the true grandeur of the tale of Troy divine, the barbaric splendor of Achilles, and the pathos of Hector, but merely Thersites, whose effective grotesqueness can be traced directly to Chapman's lines. Otherwise Shakespeare saw in the Troy story what the various mediæval compilers from Dares Phrygius to Caxton had made of it—a tissue of false romance in which the Greeks were held up to infamy as a race of schemers, rioters and braggarts, and in which the conquest of Troy was the sordid business that Virgil first suggested. The account of Hector's death, revolting to modern readers of Homer, was sound doctrine to most Englishmen of Shakespeare's day. Thus interpreted, the material lent itself not unnaturally to the indubitably powerful drama on the vanity of human wishes which the poet constructed from it. The publisher's preface of 1609 indicates that even when first produced 'Troilus and Cressida' cannot have been successful. Revivals have been most infrequent;

yet a production by the Yale Dramatic Association in 1916, thought to be the only one ever given in America, was eminently effective.

TUCKER BROOKE.

TROILUS AND CRISEYDE. This narrative poem of over 8,000 lines, written about 1380, is the longest and most elaborate work of Geoffrey Chaucer, and is by many considered his masterpiece, though it is by no means so widely known as those immortal 'Canterbury Tales' which have made his name the common property of all English-speaking peoples. As is usual with Chaucer, the main outline of the story is not original; it is, indeed, the gradual growth of perhaps 2,000 years, from Homer to Boccaccio. But Chaucer has made it his own as he made the stories of his Tales and as Shakespeare made the plots of his plays, and "by the alchemy of his genius has transmuted the baser metal into gold." Troilus, son of Priam, king of Troy, faithfully loves the beautiful Criseyde, daughter of the Trojan priest Calchas, who has deserted to the Greeks. Through the intercession of Pandar, uncle of Criseyde and friend of Troilus, the lovers are united, and for three years are supremely happy. At length, Criseyde is transferred to the Greek camp in exchange for a Trojan prisoner, and joins her father. At parting, the lovers vow eternal constancy, Criseyde, especially, assuring Troilus of her unalterable affection. Once in the Greek camp, however, she soon yields to circumstances and transfers her love to Diomede, the Greek. When Troilus becomes convinced of her faithlessness, he seeks revenge upon his successful rival, but fails, and, after performing prodigies of valor, is slain by the enemy. Criseyde and Diomede survive. The story itself is slight, and the action moves slowly; only about 1,600 lines are pure narrative; almost 6,000 lines are dialogue or soliloquy; several hundred lines are descriptive, or purely lyrical, or in the form of the poet's personal comments upon the action and the characters. The emphasis is so much more upon character than action, that the poem might almost be called a psychological novel in verse,—a surprising production for its period, and one that curiously anticipates a favorite literary method of the 19th century. In his story of love, faithlessness and despair, Chaucer treats sympathetically, yet with a sanity, a sense of values, a profound humor and a worldly wisdom that turn the tragedy into comedy, rather ironic yet neither cynical nor bitter. He has gone far beyond his immediate predecessor in the treatment of the story, Boccaccio (whose poem 'Filostrato' he used in part), in characterization, in sympathy, in numberless subtle touches that show the most penetrating observation of both the inner and the outer worlds. He has added elements distinctly English; for, in spite of his humor and his irony, he shows religious earnestness and a strong tendency to moralize; and, in the sphere of sense, he gives us English scenery, especially the May morning which he loved. Greek though the story is supposed to be, the general setting and the tone are distinctly mediæval, with characteristic disregard of "local color" and historic verisimilitude. But as a whole the poem is compounded of elements that lift it out of any particular *milieu* into the universal: love that grows into overmastering passion; devoted and self-sacrificing friendship; the lure of lovely womanhood. Its supreme excellence is its marvelous characterization. Troilus and, especially, Criseyde and Pandar, are unmatched outside of Shakespeare as examples of the interaction of character and circumstances. They show Chaucer's profound knowledge of human traits and motives; each is completely rounded, utterly consistent and convincing. Each reacts upon the others; together they mold the action, which, as in all true drama, moves logically onward to its inevitable conclusion. This is less the material of ordinary narrative poetry than of psychological drama, easy to make over into a play, as might have been done by Chaucer or Shakespeare's time, and as was actually done by Shakespeare in his 'Troilus and Cressida,' though with a curiously cynical degradation of the material. As a masterpiece of sheer poetic craftsmanship, 'Troilus and Criseyde' far surpasses anything that English poetry has to offer before the time of Spenser. Chaucer handles his seven-line stanza (*rime royale*, rhyming *ababbcc*) with an ease and variety of effect, as well as with a variety and richness of music, possible only to a great master. The monotony which might have attended the use of one form through over 1,000 stanzas is obviated by skilful and constant shifting of the cæsura or verse-pause, by a copious vocabulary, and an inexhaustible variety of rhyme. In form, then, as in matter, the poem is essentially great. It must be admitted that as mere narrative it is always prolix; that it is written in a language now archaic; that, since its time, standards of taste and literary methods have often changed; and that some effort must be made to overcome these initial barriers to a full appreciation. When these have been passed, however, it will be found that 'Troilus and Criseyde' remains, after the lapse of over five centuries, a very great work, rich in the essential elements of poetry.

The evolution of the Troilus and Criseyde story, though important and interesting, can here be only briefly indicated. Homer, in the 24th book of the 'Iliad' makes his solitary mention of Troilus as a son of Priam who died before the beginning of the poem. The cyclic poets acted upon this suggestion and developed Troilus into a hero. In the time of Constantine the Great, Dictys Cretensis' book, 'De Bello Trojano,' in which Troilus figures largely, was translated from the original Greek into Latin: and, about 635 A.D., another 'De Bello Trojano,' in which Troilus is a prominent hero, appeared in Latin as a supposed translation from the Greek of a certain Dares Phrygius. It was from Dares that Benoit de Saint Maure, troubadour to Henry II, king of England, obtained much of the material for his poem of 30,000 verses, which turns the story into a mediæval romance, and first introduces the love element by giving Troilus a mistress named Briseida, who figures in the 'Iliad' as the love of Achilles. Guido de Colonna, a judge at Messina, in 1287 translated Benoit's poem into bad Latin. From both Benoit and Guido, Boccaccio derived the material for his poem 'Filostrato' ("one stricken by love"), in which he changes the name of the heroine to Criseida (the golden one), and adds Pandar to the *dramatis per-*

sonæ. Chaucer uses only about one-half of Boccaccio's poem, condensing, amplifying, paraphrasing, ignoring, according to his needs and purpose. He draws also upon both Guido and Benoit, and even Boccaccio's prose romance 'Filocolo,' which is upon an entirely different subject, for certain details.

The standard text of the poem is that edited by W. W. Skeat (in 'Complete Works of Geoffrey Chaucer,' 6 vols., Oxford 1894). Critical works are numerous. Among these consult 'Chaucer's Troylus and Cryseyde compared with Boccaccio's Filostrato translated by William Michael Rossetti' (London 1873; Chaucer Society Publications, 1st series, 44, 65); Price, Thomas Randolph, 'Troilus and Criseyde' (Modern Language Association of America, Publications, Vol. II, pp. 307–322, 1896); Hamilton, George L., 'The Indebtedness of Chaucer's Troilus and Criseyde to Guido delle Colonne's Historia Trojano' (New York 1903); Young, Karl, 'The Origin and Development of the Story of Troilus and Criseyde' (London 1908; Chaucer Society Publications, 2d series, 40). Chapter VI of Robert K. Root's 'The Poetry of Chaucer' (Boston 1906) gives a fair and interesting criticism of the poem.

MARION TUCKER.

TROJAN WAR, The. According to Greek legend a 10 years' war carried on by the confederated Greeks led by Agamemnon (q.v.), the king of Mycenæ and Argolis, against the men of Troy with their allies. The purpose of this war was the recovery of Helen, wife of King Menelaus of Sparta, who had been carried off by Paris, one of the sons of Priam, king of the Trojans. The earliest and latest dates that have been assigned for this struggle are almost two centuries apart, the former being 1335 B.C., the latter 1149 B.C. The commonly accepted date is that of Eratosthenes, 1183. The story is that there was a gathering of the gods and goddesses, and that Eros flung a golden apple among them, addressed to «The Fairest.» Paris was given the task of deciding who was fairest, and of course got into trouble, for he named Aphrodite (q.v.) in order to gain her assistance in securing Helen. He won her, but obtained the everlasting animosity of Juno and Minerva, who aided the expedition of Agamemnon by every means in their power. Achilles, Odysseus, Ajax, Diomedes (qq.v.) and other famous adventurers, with more than 1,000 ships and 100,000 troops, sailed for Troy and laid siege to the city. The story is told at great length in Homer's 'Iliad' (q.v.) and has been so popular that every educated person feels obliged to read it, and know something of these more or less mythical heroes of ancient Greece. The wonderful adventures of Odysseus, the valor of Ajax and his brother, and the final overcoming of the city by the ruse of building a great wooden horse, surreptitiously filled with soldiers, and ostensibly sailing away, so that the Trojans were fooled into bringing the horse within their gates, has been retold by scores of historians and fiction writers. See TROY.

TROLLEY. See RAILWAYS, STREET.

TROLLING, trōl'lĭng, a method of angling that consists essentially in dragging a bait or bright object through the water, so that fishes are led to mistake it for a moving bait-fish. Trolling is ordinarily practised with a trolling-spoon, so-called because it was originally fashioned from the bowl of an ordinary teaspoon to which a hook was soldered. The modern spoon-bait is a flat piece of metal nickeled or silvered and brightly polished and variously shaped to suit the tastes of the angler so that it will spin or skip along the surface when drawn rapidly through the water. A stout hook projects from one end and the other is attached by a swivel to the line which should be protected for a foot or so by a wire or other snood to prevent it from being cut by the fish's teeth. The spoon or bait is trailed at a considerable distance behind the rowboat, sailboat or launch by which it is drawn. Trolling is effective in fishing for predaceous, surface-feeding fishes, such as pike and pickerel, blue-fish, tarpon, tuna, bonito, various species of mackerel, etc., and also (by employing a copper wire as a substitute for the line) in the capture of maskinonge and lake trout when they retire to deep waters.

TROLLOPE, Anthony, English novelist: b. London, 24 April 1815: d. Harting in Sussex, 6 Dec. 1882. He was a son of Thomas Anthony Trollope, a barrister at the law, by Frances, daughter to William Milton, an English clergyman. His mother afterward became well known in letters. Soon after the birth of this child, the Trollopes settled on a farm — the Orley Farm of one of the novels — at Harrow, where the boy was later put to school. As a poor day-boarder, he was persecuted by the masters and scholars of this famous school, and learned nothing there except a little Latin and Greek. In 1834, he obtained a clerkship in the general post office at London. After seven years' service, carelessly performed, he was appointed clerk to one of the post office surveyors in Ireland. This position, which kept him in the open air, proved most congenial. In order to increase his income, after his marriage in June 1844, to Miss Rose Heseltine of Rotherham, Yorkshire, Trollope turned his Irish experiences into fiction. 'The Macdermots of Ballycloran' (1847), and 'The Kellys and the O'Kellys' (1848), however, were failures; nor would anybody read his historical novel called 'La Vendée' (1850). Because of his good work in Ireland, Trollope was selected in 1851 to reform the letter-carrier system in southwest England. While strolling on a summer evening about the cathedral at Salisbury, the idea came to him of a novel in which should figure bishops, deans and archdeacons. Encouraged by the success of 'The Warden' (1855), he went on with the wonderful cathedral series, which includes, besides the first 'Barchester Towers' (1857); 'Doctor Thorne' (1858); 'Framley Parsonage' (1861); 'The Small House at Allington' (1864), and 'The Last Chronicle of Barset' (1867). When he had finished, the imaginary Barsetshire was as well known as any shire in England. In the midst of this work he wrote several other novels almost if not quite as good, such as 'The Three Clerks' (1858); 'Orley Farm' (1862), and 'Can You Forgive Her?' (1864). Various missions abroad in no wise interfered with his literary activity, for he could write as well in one place as in another. Early in 1858, he was sent to Egypt to make a postal treaty with the Pasha; and on his return he went out to the West Indies to inspect the postal system

there. Before setting out on the latter trip he signed a contract for a book of travel, and when he returned it was complete. 'The West Indies and the Spanish Main' (1859), the author regarded "as the best book that has come from my pen." A sojourn of nine months in the United States resulted in 'North America' (1862). After retiring from the post office in 1866, Trollope visited Australia and South Africa, and published accounts of his travels. In the meantime novel after novel came from his pen. Cathedral life exhausted, he turned to the country gentleman, producing 'He Knew He Was Right' (1869), a study of jealousy; 'The Vicar of Bullhampton' (1870), which caused a sensation; 'The Way We Live Now' (1875), dealing with schemes for getting rich quickly, and other novels of the same general type. The next year he opened a new vein with 'The Prime Minister,' the first of his political novels. In 1879 he published a biography of Thackeray, with whom he had been associated on the *Cornhill Magazine*. After becoming almost the most prolific of English novelists he died, with the manuscript of novels in his desk, on 6 Dec. 1882 at Harting in Sussex, which had been his home for two years. After suffering brief eclipse, Trollope has now come to be regarded as ranking perhaps next to Dickens as a great chronicler of English life and manners among the middle classes. Somewhat deficient in the artistic sense, he possessed wit, humor, pathos and a keen intelligence. See BARCHESTER TOWERS.

Bibliography.— The delightful 'Autobiography' published by his son in 1883, may be supplemented by F. E. Trollope's 'Frances Trollope' (2 vols., London 1895); T. A. Trollope's 'What I Remember' (3 vols., London and New York 1888–90), and 'The Recollections of Edmund Yates' (2 vols., London 1884). Mr. Henry James included a fine appreciation of Trollope in 'Partial Portraits' (New York 1883).

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TROLLOPE, Frances Milton, English novelist: b. Stapleton, near Bristol, 1780; d. Florence, Italy, 6 Oct. 1863. In 1809 she was married to T. A. Trollope, a barrister, but in 1829 she was left a widow with six children. After the death of her husband she came to this country, where she tried to establish a millinery business in Cincinnati, but not succeeding returned three years later to England, where she turned her experiences in America to account by publishing a book on the 'Domestic Manners of the Americans' (1832). The work procured her the reputation in her country of a pungent, if somewhat prejudiced, satirist, but in the United States of an unsuccessful and disgruntled alien; it gave great offense although the justice of some of her strictures is now recognized. Mrs. Trollope followed up this first success with a long series of works, chiefly novels, becoming one of the most voluminous novelists of her day. After 1844 she passed the greater part of the remainder of her life in Italy. The most successful of her novels was 'The Widow Barnaby' (1839), with its sequels: 'The Widow Married' (1840), and 'The Barnabys in America, or Adventures of the Widow Married' (1843). Among her other novels may be mentioned 'Tremordyn Cliff' (1839); 'Petticoat Government' (1859); 'Fashionable Life, or Paris and London,' her last work (1856). Consult 'Life' (1895) by her daughter-in-law, Frances Tiernan Trollope.

TROLLOPE, Thomas Adolphus, English author, eldest son of F. M. Trollope (q.v.): b. 29 April 1810; d. Clifton, Gloucestershire, 11 Nov. 1892. He was educated at Winchester and Oxford. After 1841 he lived in Italy until 1888, when he made his home in Devonshire. During his Italian residence he was a correspondent of the London *Standard* for a time, and Italian correspondent of the New York *Tribune*. His many published works include travels, novels and Italian histories. Among them are 'A Summer in Brittany' (1840); 'A Summer in Western France' (1841); 'La Beata' (1861); 'Marietta' (1862); 'Beppo the Conscript' (1864); 'Lindisfarn Chase' (1864); 'History of the Commonwealth of Florence' (4 vols., 1865); 'Dream Numbers' (1868); 'A Siren' (1870); 'Life of Pius IX' (1877); 'Sketches from French History' (1878); 'What I Remember' (1887–89), the last a sprightly, entertaining autobiography.

TROLLS, trōlz, gnome-like creatures of Norse mythology; giants in Icelandic literature; dwarfs in modern Scandinavian folklore. These latter dwell underground in a hill or mound, in this respect resembling the brownies of Scotland. Trolls are depicted as well disposed to the human race — but given to stealing provisions or even children and women. They are claimed to make themselves invisible, can foresee the future and endow human beings with extraordinary physical strength or wealth.

TROMBONE, a musical instrument of the trumpet class, an improvement on the earlier sackbut. It is a large deep-toned instrument with sliding tubes and is capable within its compass of producing every sound of the chromatic scale in perfect tune. In the orchestra three trombones are used, which harmonize with each other. The range of the alto trombone is from C above the second line of the bass to G above the treble staff; that of the treble trombone is from B, the second line below the bass staff, to G, the second line of the treble; that of the bass from C, the second line below the bass staff, to G, the second line of the treble.

TROMP, trŏmp, **Cornelis,** Dutch admiral: b. Rotterdam, 9 Sept. 1629; d. 29 May 1691. He was a son of Marten Harpertzoon Tromp (q.v.). Entering the service at an early age, he was barely 19 when entrusted with the command of a vessel dispatched against the Algerine pirates, and two years later was made rear-admiral. After distinguished service in the Mediterranean, he fought under the supreme command of De Ruyter against the English under the Duke of York, and after the defeat of the Dutch at Lovestoft (13 June 1665), displayed great skill in effecting the retirement of the vanquished fleet. In the following year he was again under De Ruyter and fought with distinction, but owing to his impetuosity in attacking an English fleet without orders, was retired from active service. Restored to his command in 1673, he displayed consummate

bravery in a series of engagements fought in June and August of that year. After the conclusion of peace with England he was placed in command of a fleet sent to the aid of the Danes against the Swedes, and won several notable victories. On the death of De Ruyter he was made comander-in-chief of the naval forces of the United Provinces.

TROMP, Marten Harpertzoon, Dutch admiral: b. Briel, 1597; d. 10 Aug. 1653. He went to sea at 10, and after a period of service in the merchant marine was taken prisoner by the English and kept in confinement for several years. In 1624 he entered the navy as captain of a frigate, and in 1637 became lieutenant-admiral. On 18 Feb. 1639 he gained an overwhelming victory over a Spanish fleet in the North Sea, off Gravelines, and in October of the same year repeated his exploit by shattering a great Spanish armament in the Downs. War between England and the Dutch broke out in 1652, and he fought an indecisive battle with Blake off Dover, 29 May 1652, but lost a great part of his fleet during a severe storm in the Channel. Supplanted by De Ruyter in the command of the fleet, he was speedily restored, and on 10 December defeated Blake near Dungeness, wresting from the English the mastery of the Channel. A rather apocryphal story represents Tromp as triumphantly parading the Channel with a broom at his masthead. From 28 Feb. to 2 March 1653 he held his own in a running fight with a greatly superior English fleet, and though he sustained some loss, succeeded in bringing into safety a large convoy of merchant ships. On 13 June he was defeated by Dean and Blake in the English Channel, but took the sea again in July, and on 10 August joined battle with Monk in the Channel. The fight was turning in the favor of the Dutch when the Dutch admiral fell, shot throught the heart.

TROMSÖ, trŏm'sė, Norway, capital of the province of Tromsö (area 10,121 square miles), at the northwest, stands on a small island of the same name, which consists of low fertile land and is five miles long. It is an old historical town, has a bishop's see, and a Roman Catholic church, town-hall, arctic museum, etc. Its fisheries are important, and there is considerable trade in oil, sealskin, herrings, dried and smoked fish. There is boatbuilding and rope-making. Notwithstanding its location near the 70° of north latitude, the climate is mild, as the Gulf Stream permeates the surrounding waters. Pop. of town about 7,447; of the island about 81,920; of the "stift or province" 226,145.

TRONA, native hydrous sodium carbonate, or soda ($H_5Na_3C_2O_8$). It has a hardness of 2.5 to 3, specific gravity, 2.11 to 2.14; vitreous, glistening lustre; gray or yellowish-white color; alkaline taste; and is not altered by exposure to a dry atmosphere. It occurs as thin crusts in Fezzan, Africa, in an extensive bed in Churchill County, Nev., and in fine monoclinic crystals at Borax Lake and elsewhere in California.

TRONDHJEM, trönd'yĕm (German, *Drontheim*), Norway, a seaport town on the west coast, the ancient capital of the country, beautifully situated on a bay at the mouth of the Nid, on the south side of the Trondhjemfiord. It has spacious, regular and remarkably clean streets, the houses being chiefly of wood. The most remarkable edifice is the cathedral, which mainly dates from the latter part of the 12th to the end of the 13th century, and is entitled to rank, as a whole, as the most remarkable ecclesiastical structure in the kingdom; it has long been undergoing extensive restorations. Among other buildings are a residence of the royal family, an academy of science, containing a valuable library and antiquarian collections, an arsenal, etc. The manufactures are not of much importance, but there are breweries, distilleries, paper-mills, and shipyards. Two railways now terminate here. The harbor was much improved, the beginning of the century, and about 600 vessels of 350,000 total tonnage enter and also clear annually. The commerce in normal years is about $20,000,000. The trade consists chiefly in exports of timber, dried and salted fish, tar and copper. Pop. 45,335. It is in the amt of Sondre Trondhjem, having about an area of 7,185 miles and population about 148,306.

TROOST, Gerard, American geologist: b. Bois-le-Duc, Holland, 15 March 1776; d. Nashville, Tenn., 14 Aug. 1850. He was educated at the University of Leyden, and was, in 1809, sent by Louis Bonaparte, king of Holland, on a tour of scientific observation to Java. The capture, by a privateer, of the vessel in which he sailed having interrupted this undertaking, he came in 1810 to the United States and settled in Philadelphia where he became a member of the Academy of Natural History, of which he was elected the first president, holding office until 1817. In 1814 he established the first alum works in the United States; and in 1825 joined Robert Owen's community of New Harmony, from which he retired at the end of two years. Removing to Nashville in 1828, he was appointed professor of chemistry, mineralogy and geology in the university there, and in 1831 geologist to the State of Tennessee, both of which positions he held until his death. He published reports on the geology of Tennessee, etc. His mineral collections were the largest in the United States.

TROOSTITE, a variety of the mineral willemite (q.v.), occurring at Ogdensburg, N. J., in large rough crystals usaully of reddish-brown, flesh, red or gray color.

TROPÆOLUM, a genus of annual and perennial herbs of the family *Tropaeolaceæ*. The species, of which there are about 45, are natives of South America, particularly Chile and Peru, whence many have been taken to all the warmer parts of the world to be grown in gardens for their odd, conspicuous flowers. They are mostly climbing vines, with alternate, usually simple, peltate leaves, from the axils of which the generally long-peduncled, irregular, usually yellow, orange or red, sometimes blue or purple, flowers are produced singly. Several species, especially *T. tuberosum*, produce edible tubers which are used for food in the tropics. The leaves and flowers of a few species are used as salads, for which their peculiar peppery flavor especially fits them. Their young, tender pods are often pickled and in this form are frequently employed as a sub-

stitute for capers. The species most used in this way are *T. majus* and *T. minus*, known as nasturtium, Indian cress and yellow larkspur, names which better fit plants of other families. Another species in popular use is *T. peltophorum*, which, like *T. majus*, is commonly employed as a climber upon porches, balconies and banks. The canary-bird flower (*T. peregrinum*) is probably more often grown indoors than out, in the north, *T minus* is a dwarf, non-climbing species which blossoms earlier and more profusely than others; it is frequently used in beds and borders. Few plants are more frequently satisfactory and popular than the nasturtiums. They will thrive in any garden soil if well exposed to the sun, and not allowed to become very dry. Since they are tender to frost they are either sown rather late or are started under glass and transplanted when the weather becomes settled. Especially fine specimens may be propagated by cuttings, and tuberous species should be dug and stored during the winter. The perennials seem to require richer soil than the annuals.

TROPHONIUS, trō-fō'nĭ-ŭs, builder of the temple of Apollo at Delphi. After his death he was reverenced as a hero, and had an oracle in a cavern near Lebadeia in Bœtia. Pausanias describes how, after purifying himself, he was drawn through the mouth of this cave by an unseen power, and details all that he witnessed there. Don Quixote's famous visit to the oracle preserves its memory in modern literature.

TROPHY, *in antiquity,* a monument or memorial in commemoration of some victory. It consisted of some of the arms and other spoils of the vanquished enemy, hung upon the trunk of a tree or a stone pillar by the victorious army. The custom of erecting trophies was most general among the Greeks, but it passed at length to the Romans. It was the practice also to have representations of trophies carved in stone, in bronze or similar lasting substance. In modern times trophies have been erected in churches and other public buildings to commemorate victories or heroic action in war. The term has been extended to describe any group of objects hung on a wall to commemorate an event, industry or activity.

TROPIC-BIRD, a sea-bird of the family *Phætontidæ*, related to the pelican. The bill in these birds is sharp, curved superiorly, and is as long as the head. The two middle feathers of the tail are very long and narrow, giving the birds the names boatswain-bird or marlinspike among sailors. They inhabit the tropical seas and can fly for days together without visiting land, resting and sleeping on the water. A large and well-known species is *Phaeton æthereus*, which averages about two and one-half feet in length, the tail-feathers being about 15 inches. It is most often seen in the Indian Ocean, where it breeds on the Mascarene Islands. The yellow-billed tropic-bird (*P. flavirostris*) is smaller and more often seen in the western Atlantic, since it annually visits Bermuda and the Antilles to breed, laying but a single, heavily blotched egg in a hollow of the beach, or sometimes in a rude nest in a tree. Consult Newton, 'Dictionary of Birds' (New York 1896).

TROPICAL FOREST PRODUCTS. The products of forests are usually divided into two great groups, as follows: (1) Major forest products, such as wood used for construction purposes and for special uses, as furniture, cabinet work, wood used for small articles of all kinds, etc.; (2) Minor forest products include firewood, tannin extracts, dyes, rubber, gutta percha, rattan, bamboo, wood oils, resins and various forest plants that produce medicinal products, like quinine, cocaine, sarsaparilla, epicac, camphor, etc. As a matter of fact, the value of these minor products of tropical forests consumed in the world's markets greatly exceed the value of the major products. Indeed, so great is the demand for some of the minor forest products that many of them have almost entirely become cultivated ones. Ten or 15 years ago while most of the rubber of commerce came from a wild forest tree (*Hevea braziliensis*) of the Amazon valley, approximately 80 per cent of the rubber used to-day is from cultivated plantations of this tree in the Eastern tropics.

Kapoc is the commercial name for the cotton from the so-called cotton tree (*Ceiba pentandra*) and is a native of tropical America, but the chief source of this valuable product, used principally in stuffing mattresses, is from plantations in Java. Formerly the chief source of the Peruvian bark, quinine (*Cinchona* species) was from the wild forests of Ecuador, Colombia and Peru. To-day most of the quinine comes from cultivated plantations in India and Java. The lack of cheap labor in the American tropics is the chief reason why these valuable products are cultivated in the Eastern tropics.

Because the climatic conditions of temperate regions are not favorable for the production of many tropical minor forest products, the temperate markets must always depend on the tropics for most of them unless synthetic products can be substituted. While efforts made to produce synthetic rubber have not proved successful, yet the manufacture of synthetic dyes has greatly reduced the demands for the dye woods of the tropics, hence until the war greatly, but temporarily, stimulated the use of tropical dye woods, the amount of these woods used in the markets is not likely to be greatly increased.

On the other hand tropical woods for construction purposes have not been in demand in the great lumber markets of the world, the United States and Europe, principally because the forest of these regions have light timbers in large quantities that are better suited for general construction timbers than the so-called hardwoods of the tropics. The coniferous woods, or softwoods, of the temperate regions of North America, Europe and Asia stand in sharp contrast with that of the hardwood forests of the tropics. On the one hand coniferous forests occur in pure, or nearly pure, stands that make their lumbering on a large scale more profitable, hence the lumber industry has been highly developed; on the other hand the hardwood tropical forests are more complex in character and usually far away from well-developed industrial regions, hence capital has not been attracted to their exploitation on a large scale. Moreover, because of the great development of the lumber industry, es-

pecially in the United States, there has been an over-production; the surplus finds its way to all parts of the world and large amounts have been absorbed by tropical countries. The contribution that tropical forests have made to the lumber markets has been woods for special uses rather than those for general construction purposes. Many woods of tropical countries are used locally for general construction purposes, that never find their way into outside markets. The study of tropical forests show that while they are more complex in composition than coniferous forests of temperate regions, yet this complexity is not so great as formerly supposed. The complexity is increased by the undergrowth trees that do not reach commercial size. The trees that reach huge size and overtop the undergrowth species are composed of comparatively few species whose woods are little known. Also, a large percentage of these trees produce rather soft hardwoods that are easily worked. Thus, the estimated stand of timber in the Philippines is 200,000,000,000 board feet, more than 100,000,000,000 of which are light hardwoods that can be and are being substituted locally for many purposes to which imported coniferous woods were put. These forests also occur in sufficiently heavy stands to warrant the establishment of fairly large lumbering operations that will reduce the cost of their utilization. A recent estimate of the area and stand of timber in some of the large tropical forest regions is as follows:

FOREST REGION	Forested area in million acres	Stand of timber in billion board feet
Southern Brazil	260	650
Amazon Basin	1,024	3,400
Northern South America	200	500
Indo-Malay Region	320	1,600
Total	1,804	6,150

The forested area of the United States is estimated at 550,000,000 acres, carrying a stand of timber of 2,800,000,000,000 board feet. Thus the Amazon region alone is estimated to have some 600,000,000,000 feet more than is found in the United States.

At the present time it is not possible to connect the market or local name of many of the tropical woods with the specific scientific name of the trees producing them, for much systematic work in botany is necessary before this can be done. Indeed, as in some temperate woods, a group of species stands for the wood. Thus the term oak stands for several species of the genus *Quercus* and the trade term pine refers to a large number of species of *Pinus* and even to many other coniferous woods not of this genus. Also where adjectives are prefixed to the market names, the name may include more than one species; several species of oak produce "white oak," and "southern yellow pine" is the product of a number of species of *Pinus*. The same holds true for tropical woods. An attempt is made below to classify some of the principal groups of tropical woods. These include many of those that are found in American and European markets, and a few that play an important rôle in the countries in which they occur.

I. The Mahogany Family (*Meliaceæ*).—1. The "true" mahogany originally came from *Swietenia mahagoni Jacq.* and seems to be entirely restricted to the West Indies and Southern Florida. Late investigations show that the *Swietenias* of southern Mexico, Central America and, perhaps, Colombia, are two different species and at least some of that from Venezuela is a fourth species.

The wood of the four species is accepted as true mahogany, and when placed on the market usually bears the name of the place or region from which it comes. Thus we have Cuban, Santo Domingo, Honduras, Nicaragua, Mexican, etc., mahogany. Santo Domingo mahogany is considered the most desirable grade. Throughout this range the wood is locally known under the Spanish name of caoba. The different grades of mahogany vary in weight from 35 to 52 pounds per cubic foot, and cannot be considered as very heavy. Mahogany is red in color, beautifully grained, easily worked and is durable. It takes a natural polish, is adapted to stains and takes glue well. The combination of these qualities makes it the furniture wood par excellence of the world. Most of the substitutes of true mahogany fail in one or more of these qualities and hence are inferior.

2. *African Mahogany.*—The growing scarcity of easily-accessible true mahogany has led to the introduction of many woods as substitutes. The best of these belong to the same family (*Meliaceæ*). Under the general name of African mahogany the tropical regions of West Africa have supplied large quantities of mahogany. Perhaps the best known of these is the Gambia or Senegal mahogany (*Khaya senegalensis*, A. Juss.), although other species of this genus and species of the genera *Trichilia, Carapa, Entandrophragma* and a number of species of other families furnish African mahogany.

3. *Spanish cedar, Cigar box wood, Cedro.*—The above are the commercial names of a number of species of the genus *Cedrela* which occur throughout the American tropics from the West Indies and Mexico to Paraguay and northern Argentina. The original Spanish cedar (*Cedrela odorata* L.) appears to be confined to the West Indies and has a strong cedar odor, hence the name. It is used mostly for cigar boxes. Most of the *Cedrelas* of the American continent, known everywhere under the Spanish name of *cedro*, seem not to hold this strong odor when exposed to the air for some time. The wood of *cedro* closely resembles that of true mahogany in many respects, except that it is usually much softer and lighter in weight. The heavier grades are about the same weight as the lightest mahoganies. There is little doubt that some of the so-called mahogany found in the markets is really *cedro*. *Cedro* is a common and much-prized wood in the markets throughout all Latin American countries, especially in Argentina. It is used for furniture and light construction work, principally interior finish of houses. The genus *Toona* (formerly called *Cedrela*) found in parts of the eastern tropics produces woods almost identical with that of *cedro*. In the Philippines a species of this genus (*Toona*

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[illegible] as [illegible] the market [illegible] region [illegible] have Cuban, [illegible] Mexican, [illegible] mahogany is [illegible] Through- [illegible] known under [illegible] different [illegible] from 35 to [illegible] and [illegible] very [illegible] Mahogany is red [illegible] artifully [illegible] worked and [illegible] It takes a natural polish [illegible] and takes [illegible] The [illegible] qualities makes it the [illegible] excellence of the [illegible] the sub- [illegible] quality and [illegible]

African Mahogany.—The growing [illegible] true mahogany [illegible] family (*Meliaceæ*) [illegible] Afri- [illegible] West [illegible] of ma- [illegible] these is [illegible] (*Khaya* [illegible] species [illegible] genera *Tri-* [illegible] a number [illegible] African

Cigar box wood, Cedro.— [illegible] of a num- [illegible] genus *Cedrela* which occur [illegible] American tropics from the West [illegible] to Paraguay and northern [illegible] original Spanish cedar (*Ce-* [illegible] appears to be confined to the [illegible] a strong cedar odor, hence [illegible] mostly for cigar boxes. [illegible] of the American cont- [illegible] where under the Spanish name [illegible] to hold this strong odor when [illegible] for some time. The wood [illegible] resembles that of true mahog- [illegible] respects except that it is usually [illegible] and lighter in weight. The heavier [illegible] about the same weight as the light- [illegible] There is little doubt that some [illegible] called mahogany found in the markets [illegible] *Cedro* is a common and much- [illegible] the markets throughout all Latin [illegible] countries especially in Argentina. It [illegible] furniture and light construction [illegible] interior finish of houses. The [illegible] (formerly called *Cedrela*) found [illegible] the eastern tropics produces woods [illegible] identical with that of *cedro*. In the [illegible] a species of this genus (*Toona*

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calantas, Merr. & Rolfe) has the common name of *calantas*, and in India another species has the common name of *toon*.

4. *Carapa or Demarara Mahogany* (Guiana), *Andiroba or Brazilian mahogany* (Amazon region).—In the lowlands from the mouth of the Orinoco River (Venezuela), in the Guianas and to and including the Amazon Valley, is found a wood bearing the above names which is the product of *Carapa guianensis* Aubl. This wood resembles mahogany in some respects but is much coarser grained. It makes a good, cheap substitute for this wood, but is locally used for much the same purposes as *cedro*.

Besides the above woods all belonging to the mahogany family, together with others of less importance, there are a large number of species belonging to different families that appear in the markets under the name of mahogany. In all about 60 such species have been listed. The most important of these are discussed below in connection with the family to which they belong.

II. The Locust Family (*Leguminosæ*).—The locust family, represented in our temperate flora by such trees as the black locust, honey locust and others, has a large number of species of soft, hard and very hard woods that are used locally in the tropics for all sorts of purposes, and some of them find their way into temperate markets.

1. *Rosewoods, Jacarandá or Caviúna* (Brazil); *Blackwood* (India).—The name "rose" was applied to this wood because of a fragrant odor resembling that of the rose. Similar woods without the odor also bear this name. The woods are dense, heavy, durable and are dark brown or black in color, sometimes streaked with purple, rose and other colors. Their chief use is in furniture, pianos, inlaying and small turnery objects. The main source of the rosewoods is Brazil. Here the true rosewood of the Rio de Janeiro region is referred to *Dalbergia nigra* Allem, and that of the Amazon region to *Dalbergia spruceana* Hub., but it is known that a number of species of *Machærium* produce rosewood. The rosewoods of Central America are supposed to come from species of *Dalbergia*. A similar wood of Colombia under the name of *negrillo* or *granadillo* is a species of *Machærium*, though the name granadillo is applied to a number of other woods. The Indian rosewood is *Dalbergia latifolia* Roxb. A similar wood (*Dalbergia melanoxylon* Guill. & Perr.), under the name of Senegal ebony, comes from Africa. In a broad sense the *cocobola* wood of Panama (*Dalbergia retusa* Hemsl.) can be classified as a rosewood. Other woods of less importance in different genera of this family and species of other families are often classed as rosewoods. Some of these have the blackish color and others are classified as rosewood because of their rose color.

2. *Padauk* (India); *Narra* (Philippines); *African Padauk* (Africa).—The genus *Pterocarpus* produces a number of woods usually of a beautiful red color, but sometimes yellowish red and even nearly black. These woods have a similar use to those of the rosewoods and are sometimes given the name of mahogany. The chief source of the best *padauk* (*Pterocarpus dalbergioides* Roxb.) is the Adaman Islands (India), though *P. indicus* Willd. and other species of Burma and India and the Philippines produce similar woods. In the Philippines the local name is *narra*. It has been exported to the United States under the name of Philippine mahogany.

3. *Brazilwood; Logwood, or Campeche.* Brazilwood is a reddish yellow wood mainly produced by certain species of the genus *Cæsalpinia*, and perhaps by *Hæmatoxylon brazilleto* Karst. It is exported chiefly as a dyewood. Brazilwood from the eastern tropics was known in Europe before America was discovered. When Brazil was discovered, because of the abundance of this wood along the coast in the region of Rio de Janeiro, the country was named after the wood. *C. sappan* L., and perhaps related species, is the source of brazilwood from the Eastern tropics. It is known in India under the name of sappan-wood and in the Philippines as sibucao. While scattered throughout the American tropics, the chief commercial source is Brazil and the Caribbean Sea region. The source of the wood from Brazil seems to be *C. echinata* Lamck., though there is some doubt about it. It is known locally as *ibirapitanga* or *páo Brazil*, and also has the export name of Pernambuco wood. The brazilwood of the Caribbean region seems to be mostly *Hæmatoxylon brazilleto*. Logwood or campeche (*Hæmatoxylon campechianum* L.) is blood red in color and yields a dye (stain) known as hæmatoxylon. It comes chiefly from Southern Mexico and Central America. It is semi-cultivated in India and parts of the West Indies.

4. *Dividivi* (*Cæsalpinia coriaria* Willd.).—The pods of this tree are rich in tannin and they are exported in considerable quantities principally from Colombia and Venezuela where the tree grows in dry districts where it is wild or semi-cultivated.

5. *Tonka bean* (Guianas and Venezuela); *Cumarú* (Amazon).—The beans of this tree (*Dipteryx odorata* Willd., and one or more closely related species) after being treated in casks of rum, are exported in considerable quantities principally from the region south of the Orinoco River in Venezuela. They are used in making perfumes and flavoring extracts. The wood of *cumarú* is very hard, difficult to work, yellow in color, streaked with red, and is used to some extent in the Amazon region.

6. *West Indian Locust; Courbaril; Algarroba* (Venezuela and Colombia), *Jatahy* (Brazil).—The West Indian locust is the English name for a wood produced by *Hymenæa courbaril* L., although in Brazil, under the name of *jatahy*, besides the above, there are several species of *Hymenæa* that give similar woods. The wood is red with dark streaks. It is used locally but little exported. The different species yield a resin known as South American *copal*, or *courbaril*, which is exported in considerable quantities especially from northeastern Brazil. Bodies of the resin are deposited in the ground on the death of the tree and are thus mined.

7. *Copahyba.*—This is the Brazilian name of a wood similar to the West Indian locust and with the same uses. It is produced by several species of the genus *Copaifera*. The tree produces an oil known as *aciete* or *copaiba* oil that is exported to some extent. It is found also in northern South America and neighboring regions.

8. *Araribia* (Brazil); *Cartan* (Venezuela); *Guayacan jobo* (Colombia); *Amarillo de Guayaquil* (Panama).—This group of woods comes from several species of the genus *Centrolobium*. The woods vary from a bright reddish yellow to yellow streaked with darker color. They are used quite extensively locally, especially in Brazil and deserve to be exported as fine furniture woods.

9. *Acapú*.—The acapú (*Vouacapoua americana* Aubl.) is a reddish brown wood, with dark, almost black, streaks, and very hard and heavy, that comes from the Amazon valley and is exported in some quantities.

10. *Purpleheart, Violet wood; Guarabú or Páo Roxo* (Brazil); *Nazareno* (Panama); *Tananeo* (Colombia).—These woods are generally referred to the genus *Peltogyne* and found from Panama to Brazil, though species of closely related genera may produce some of them. The woods are dark purple, sometimes with violet shades. They are quite extensively used in Brazil and British Guiana for many purposes. Some of them yield an odorous resin used medicinally and a red dye used for textile fabrics. Purpleheart has been exported from British Guiana and neighboring islands.

11. *Balsamo; Balsamo de Tolu* (Colombia); *Oleo or Cabreúva* (Brazil); *Incienso* (Argentina).—The general name of *balsamo* is here applied to a group of woods that come from the genera Myroxylon and Myrocarpus. The woods are dark or yellowish red in color and the bark or wood or both yield oily substances. The bark of the balsamo of Colombia (*Myroxylon balsamum* [L] Harms.) yields a resinous oil, *balsamo de tolu*, that is exported to some extent. The woods are used locally and deserve to find wider markets. The *cabreúva* or São Paulo, Brazil, is probably the most used. The *incienso* of Argentina, a scented wood, is highly valued in Argentina.

12. *Ipil* (Philippines); *Mirabeau* (Borneo and Malay Peninsula).—The genus *Instia* especially *Instia bejugo* [*Colebr.*] O. Ktze. is the main source of the wood. It is yellow when fresh cut but turns reddish brown to chocolate color when exposed. It is highly valued for construction work in contact with the ground. In the Philippines it is one of the principal woods used for railroad ties.

13. *Tindalo* (Philippines).—This wood is the product of *Pahudia rhomboidia* (Blanco) Prain. The wood is yellowish red, becoming very dark with age. It is greatly prized for flooring, fine interior finish and furniture.

14. *Acle* (Philippines); *Pyingado* (Burma).—Both these woods resemble each other closely in structure. In color they are dark brown and resemble in this respect the black walnut. The *acle* (*Albizzia acle* [Blanco] Merr.) is highly prized in the Philippines as a fine furniture wood. The *pyingado* (*Xylia dolabriformis* Benth.) grows in the teak forests and is used extensively for railroad ties.

The above are only a few of the many woods produced by the *Leguminosæ*.

III. Lauan or Dipterocarp Family (*Dipterocarpaceæ*).—From the standpoint of producing lumber for general construction purposes this is the most important tropical family, because the species compose a large percentage of the lumber in the forests in which they occur, and the woods are easily cut and worked. The family is confined to the eastern tropics, especially to Borneo, the Philippines, Sumatra, Malay Peninsula and parts of Burma and India. With respect to their hardness and durability the woods can be divided into a number of groups.

1. *Lauan, Tanguile* (Philippines); *Seriah or Meranti* (Borneo, Malay Peninsula).—This group of woods is found throughout nearly the whole range of the family. Besides the above there are very many local names for the different species which belong to genera *Pentacme, Parashorea*, and certain species of *Shorea*. They are the most abundant of the dipterocarps. The woods of the *lauans* (to use the local Philippine name for the whole group) are all light hardwoods, not durable, as easily worked as pine; locally they are used for all light construction purposes. In regard to color they are classified as *white* and *red lauans*. The latter include *tanguile*. The better grades of the *red lauans* show resemblance to mahogany and large quantities have been shipped to the United States for mahogany. Of these *tanguile* (*Shorea polysperma* [Blanco] Merr.) is the best. In the United States it is usually sold under the name of *Bataan mahogany*. The product of other species, mostly *Shorea negrosensis* Fox., sells in the United States as *Philippine mahogany*. Certain *red lauans* from Borneo are sometimes sold in England as *Borneo redwood*.

2. *Apitong* (Philippines); *Kruen* (Borneo and Malay); *Eng.* (Burma), *and other names for these and other regions*.—This group of woods belongs to the genus *Dipterocarpus*. In contrast with *lauan, apitong* is a moderately, not very durable, hard wood, of a reddish brown color. It finds its greatest use for heavier construction purposes not in contact with the ground.

3. *Yacal* (Philippines); *Selangan batu* (British North Borneo and Dutch East Indies); *Ressak* (Dutch East Indies); *Thingan* (India), *and other local names for these and other regions*.—This group of woods is the product of certain species of the genera *Hopea* and *Shorea*. The yacals are dark brown in color and are the hard, durable woods of this family. They are comparatively easily worked and are most valuable for construction work in contact with the soil and any construction where durability and great strength are required. They are a good substitute for teak in many classes of shipbuilding.

4. *Guijo* (Philippines); *Sal* (India).—These woods are like the apitongs but finer grained and more durable. The *Sal* (*Shorea robusta* Gaertn. f.) is one of the most important timbers of India. The *guijo* (*Shorea guiso* [Blanco] Blume) is one of the most useful timbers of the Philippines.

5. *Borneo camphor; Kapor* (Malay name).—This wood, the product of *Dryobalanops aromatica* Gärtn. yields a substance that closely resembles camphor for which it is sometimes used. It is known only from Borneo, Sumatra, and the southern end of the Malay Peninsula.

IV. The Brazil-nut or Monkey Pot Family (*Lecythidaceæ*).—This family is confined mostly to South America. The woods of the family, while at present little used, promise to play an important rôle in the future lumber industry of South America, because in many

TROPICAL FOREST PRODUCTS

1 Parana Pine (Araucaria braziliana), forest of Southern Brazil. The undergrowth tree is Embura (Nectandra sp.), the timber de luxe of the region. 2 Cedro or Spanish Cedar (Cedrela sp.), in the forests of Southern Brazil. Cedro is one of the most common woods used throughout tropical America. 3 Lapacho (Tecoma sp.), in the Alto Parana region of Argentina. Equivalents of this wood, belonging to closely related species of the genus Tecoma, occur in the forests from Mexico to Northern Argentina. 4 A Lauan or Dipterocarp forest of the Philippine Islands. Among the species in this forest is Red Lauan (Shorea negrosensis), whose wood is sometimes sold as Philippine mahogany in the United States

1 Tanguile (Shorea polysperma), Philippine Islands. Wood of this tree is sold in the United States under the name of Batasan mahogany
2 African mahogany logs in West Africa

places the members of the family are very abundant. The important members of the family have large cup-shaped fruits, called by the English monkey pots. The trees of the family are the giants of the forests, and in parts of the Magdalena Valley, the Amazon Valley, British Guiana and the coastal forests of Brazil they form the most important element in the composition of the forest.

1. *Brazil nut; castanheiro* (Brazil).—The *Brazil nut* (*Bertholletia excelsa* H.B.K.) is one of the largest trees of the Amazon and is the source of the Brazil nuts of commerce. Because of the value of the nuts the wood is little used.

2. *Colombian mahogany, Albarco* (Colombia).—The wood of this tree is the product of *Cariniana pyriformis* Miers. It is abundant in foothills bordering the large rivers. Because of the resemblance to mahogany it has been shipped to the United States under the name of *Colombian mahogany.*

3. *Jequitibá* (Brazil).—This is the product of several species of *Cariniana* (by some authors, *Couratari*) and is abundant in the coastal forests from Bahia to São Paulo, and the interior of the state of São Paulo. The wood is reddish, comparatively soft and would make a better substitute for mahogany than albarco, because it is more easily worked. In Brazil it is used for construction purposes.

4. *Monkey pots, Coco de Mono* (Colombia); *Kakeralli* (British Guiana); *Sapucaya* (Brazil).—This group of woods is the product of several species of the genus *Lecythis* and occurs from São Paulo, Brazil, to Panama. The wood, reddish brown in color, is used locally for construction purposes in contact with the ground, and in Brazil is especially valuable for railroad ties. Several species from Brazil with the name of *sapucaya* furnish the so-called *paradise-nut* of commerce.

5. Other woods in the Amazon Valley worthy of mention are the following: *Matamata* (*Eschweilera matamata* and other species) is a wood highly valued for salt-water construction because it resists well the action of the shipworm (teredo). The *tauarys* are products of several species of the genus *Couratari* and are used locally for shipbuilding.

V. The Laurel Family (*Lauraceæ*).—Besides producing the cinnamon (*Cinnamonum zeylanicum* Breyn.), found in South and West India, and Ceylon where it is extensively cultivated; the *camphor* (*Cinnamonum camphora* [L.] Nees & Eberm.) principally from Formosa; and the *alligator pear*, or *aguacate*, or *avocado* (*Persea americana* Mill.), originating in parts of the American tropics and widely cultivated, this family produces a great variety of timbers found scattered throughout the tropics. In the American tropics many of these timbers occur under the general names of *canella* (Spanish and Portuguese), *laurel* (Spanish) and *louro* (Portuguese). The best-known woods are the following: (1) *Greenheart* (*Nectandra rodioei* Schomb.) found principally in British Guiana from which country it is exported as a first-class wood for salt-water construction purposes. Large quantities of it were used in the building of the Panama Canal. When fresh cut the wood is grayish brown in color but on exposure turns to a dark green or chestnut color. (2) *Billian or Borneo Ironwood* (*Eusideroxylon swageri* T. and B.) is the eastern counterpart of the greenheart so far as use is concerned. It is exported mostly from British North Borneo. The wood is yellow when fresh cut, but on exposure turns to a glossy brown. (3) *Embuia* (species of *Nectandra*) is the timber de luxe of parts of Southern Brazil and because of its great durability is extensively used as a railroad tie. It occurs in the Paraná pine forests of the states of Paraná and Santa Catharina, Brazil.

VI. The Quebracho or Sumac Family (*Anacardaceæ*).—This is the family to which the sumac and poison ivy of our flora belong. The best known member of this family is the tree that produces the mango fruit (*Mangifera indica* L.), a native of the eastern tropics but introduced throughout the western tropics.

1. *Quebracho* (Argentina and Paraguay).—The wood of this tree (*Schinopsis balansæ* Engl.) yields a valuable extract much used for tanning purposes and locally it also furnishes a very durable railroad tie. It is logged mostly in northern Argentina and the value of the exports of wood and tannin extract reach a higher figure perhaps than the value of all the other exported forest products of South America except rubber. The wood of another species (*S. lorentzii* [Griseb.] Engl.), also called *quebracho*, and found in northern Argentina principally, contains tannin, but at the present time it is little used for this purpose. The woods of a number of other South American species of this and other families are called quebracho. These should not be confused with the real quebracho, although some of them do contain tannin.

2. *Gonçalo Alves* (Brazil); *Diomate* (Colombia); *Gateado* (Venezuela); *Urundoy* (Argentina), and other local names for these and other parts of the American tropics. This group of woods comes from several species of the genus *Astronium* which presumably extends from Central America to northern Argentina. It has been introduced in the United States under the name of *king wood*. In color the wood is brownish red with black, or nearly black, streaks. It is used for construction purposes (in Brazil for railroad ties) and as a cabinet and furniture wood.

3. *Espavo* (Panama); *Caracoli* (Colombia and Venezuela); *Mija or Mijagua* (Venezuela).—This is reddish, moderately soft wood, found in northern South America and adjoining regions, and is used locally to some extent as a light construction material. From Panama it has been exported to the United States under the name of *espave mahogany*. It is the product of *Anacardium rhinocarpus* D. C.

VII. The Teak Family (*Verbenaceæ*).—*Teak* (*Tectona grandis* Linn.) has long been known as the best shipbuilding timber in the world. The wood is moderately hard, very durable, strongly scented, dark golden yellow in color, turning brown to almost black with age. It is mainly the product of Burma and India, though there are extensive plantations in Java and smaller ones in other parts of the eastern tropics. In the Philippines, *Molave* (*Vitex paviflora* Juss.) is another member of this family that is locally very much used, especially for shipbuilding and construction work in contact with the ground.

VIII. Miscellaneous Woods.— 1. A group of woods known as *Lepacho* (Argentina), *Ipé* or *Páo d'arco* (Brazil), *Surinam Greenheart* (Guiana), *Araguanay* (Venezuela), *Guayacan* (Colombia, Ecuador and Panama) and many other local names, are of a greenish or brownish yellow color, hard, durable and much used for heavy construction work in contact with the ground. They belong to various species of the genus Tecoma (*Catalpa* or *Bignoneaceæ* family). Some guayacan has been shipped to the United States under the name of Lignum Vitæ. (See below).

2. *Peroba.*—This is the generic common name for a group of rose colored or brownish yellow woods that occupy the most common place in the hardwood markets of Rio de Janeiro and São Paulo (Brazil). They are moderately hard, easily worked, and are used for heavy and light construction work, interior finish and for making furniture. The *peroba rosa* (known as *carreto* in Colombia and Venezuela), and in part the *peroba amarello* (Brazil), are the product of certain species of *Aspidosperma* (*Apocynaceæ*). Much of the *peroba amarello* seems to come from certain species of *Tecoma* of the *Bignoniaceæ*.

3. *West India or Venezuela Boxwood.*— The growing scarcity of the true boxwood (*Buxus sempervirens* L.), valuable for rulers and wood-engraving, has led to the introduction of some tropical woods as substitutes. The chief candidates for these substitutes seem to be the following: (a) *Roble blanco,* a *Tecoma* species (*Bignoniaceæ*) from Venezuela and West Indies; (b) species of *Casearia* (*Flacourtiaceæ*), principally from the Maracaibo region of Venezuela, and certain species of *Aspidosperma* (*Apocynaceæ*) from Venezuela. The last two usually are known under the name of *zapatero.* Certain species of *Aspidosperma* under the name of *piquiá marfim* or *marfim* (marble) are found in southern Brazil, although these seem not to have been exported as boxwood. The woods mentioned above are light yellow in color, fine grained, and hard and compact.

4. *Laurel* (Spanish), *Louro* (Brazil).— Scattered throughout the moist regions of the American tropics, under the above names, are a group of woods belonging to the genus *Cordia* (*Borraginaceæ*). They are brownish in color, strong and easily worked, hence are much used for certain classes of construction work. The woods under these names should not be confused with the members of the *Lauraceæ* family mentioned above.

5. *Balsa wood or cork-wood.*— Scattered throughout the damp American tropics, usually under the name of *balsa,* are a group of very light woods (about eight pounds to the cubic foot) that have recently been much used in the making of buoys for life boats and are now being used for lining refrigerators. They are usually referred to *Ochroma lagopus* Sw. (*Bombacaceæ*), but it appears now that several species of this genus produce this wood.

6. *Kapoc; Cotton tree; Ceiba* (Spanish); *Samaúma* (Brazil).— The *kapoc* of commerce is the cotton from the fruits of a tree (*Ceiba pentandra* Gærtn., family *Bombacaceæ*), and is exported mainly from planted trees in Java, and is used extensively in stuffing mattresses. The tree, however, is a native of the moist American tropics and is one of the largest in the forests. The wood is very soft and at present is very little used.

7. *Ebony.*— The true ebonies of commerce come usually from certain species of the genus *Diospyros,* the persimmon family (*Ebenaceæ*). The trees that produce this wood are found very scattered throughout the tropical forests of both hemispheres. The woods are very hard and dense and generally black or brown streaked with black. The growing scarcity of true ebony has led to the introduction of many substitutes belonging to species of other families.

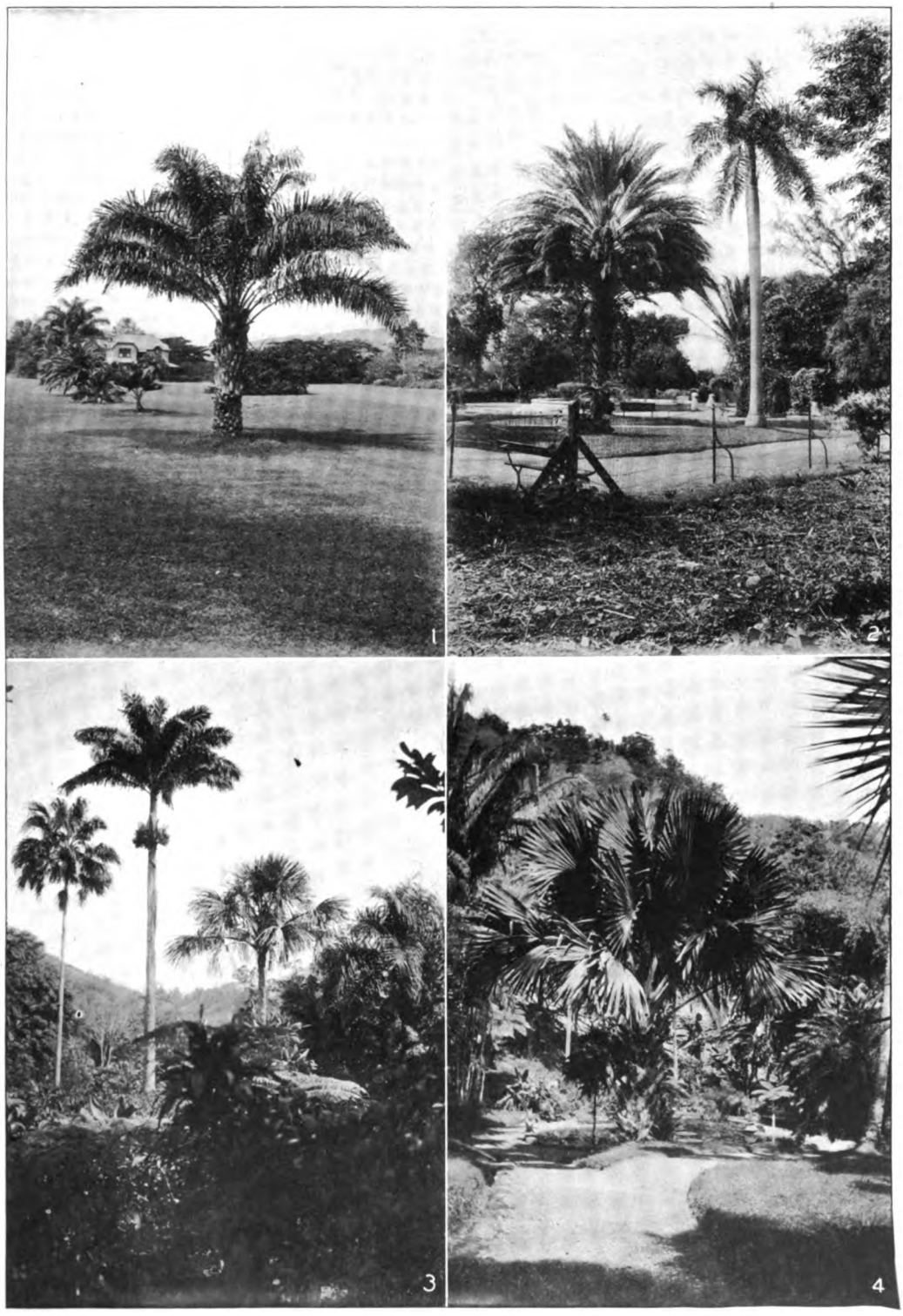
8. *Fustic, Mora* (Latin America).— *Fustic* is the market name of perhaps the most important dyewood of commerce. It is mainly exported from the Caribbean Sea region of the American tropics. It is the product of *Chlorophora tinctoria* L. Gaud. of the family *Moraceæ.* It is used in dyeing shades of yellow, brown, olive and green.

9. *Lignum Vitæ; Guayacan* (Spanish).— This is usually the product of various species of *Guiacum officinale* L. and *Guiacum sanctum* L., although other species of *Guiacum, Bulnesia arborea* Engl. (locally known from Venezuela as *vera*), and *Bulnesia sarmienti* Lorentz (known from Argentina as *palo santo*), furnish some of the wood. They all belong to the family *Zygophyllaceæ.* The wood reaches the markets of the world principally from the West Indies, Northern South America and Central America. The wood is much used in certain parts of shipbuilding especially in stern bushings and for bowling balls, bed castors, pulleys, etc. It is extremely hard and heavy and oily.

IX. The Mangrove Family (*Rhizophoraceæ*).— The mangrove forests of the tidal swamps of tropical regions, composed mostly of species of the above family, are literally forests of the sea. Although found best developed in the estuaries of large rivers in the eastern tropics, they are also present in the western hemisphere. Here one species (*Rhizophora mangle* L.) is found, while in the Eastern tropics a number of species of this genus, and of the genera *Bruguiera* and *Ceriops,* form the main composition of the forests. While there are many local names for the different species in the eastern hemisphere, the general local name in the Philippines and Spanish America is *mangle,* and in Brazil, *mangue.* In proportion to the area they cover they are locally the most valuable of all the forests for they are the main source of firewood and tannin extracts. The latter, especially from Borneo, is exported in considerable quantities.

X. The Pine Family (*Pinaceæ*).— While the woods of the pine family are marketed mainly from temperate zones, mostly the North Temperate, yet the highlands of the tropics and subtropics contain a number of "pines" that are used locally and are coming to be exported to some extent. Many of the true pines (*Pinus*) and other genera of the western part of the United States extend into Mexico and in some parts form extensive forests. Pine in merchantable quantities is also found in parts of the West Indies, and in Guatemala and Honduras of Central America. Preparations are already being made to exploit these forests.

TREES, TROPICAL



1 Oil Palm (Elæis guineensis)
3 a. Livistona subglobosa. b. Euterpe oleracæa. c. Mauritia flexuosa

2 a. Date Palm (Phœnix dactylifera). b. Cabbage Palm (Oreodoxa oleracea)
4 Indian Fan Palm (Corypha elata)

India, Burma and the Philippines contain true pines that are used locally. The lower slopes of the Himalayas in India also contain other genera of the family that are quite extensively utilized. In the semi-tropical regions of the Brazilian states of Paraná, Santa Catharina and Rio Grande del Sul, and in the state of Missiones (Argentina), occur very large areas of the *Paraná pine* (*Araucaria braziliana* A. Rich.). There forests contain about 200 billion board feet of standing timber and are playing an important rôle in furnishing softwood lumber to the adjoining industrial regions of southern Brazil, Argentina and Uruguay.

XI. Bamboos (*Graminæa*).— The bamboos and their allies are the grass trees of the tropics. They furnish cheap wood for the poorer classes for construction purposes and for almost every use to which wood can be put. Bamboos are more abundant in the eastern than in the western tropics where, besides occurring as constituent parts of some wild forests, they are extensively planted, also to some extent throughout the western tropics. The construction bamboos belong principally to certain species of the genera *Bambusa, Arundinaria* and *Dendrocalamus*. While wild bamboos occur in the western tropics and are cultivated to some extent, they do not play so important a part in the life of the people. In certain parts allies of the bamboos or canes take their place. These are the cana brava (*Gynerium sagittatum* [Aubl.] Beauv.), and species of *Guada* known locally in the Amazon as *taboca* and in Ecuador under the market name of *Guayaquil cane*. This is rather extensively exported as a construction wood to the dry treeless coastal regions of Peru and Northern Chile.

XII. Palms (*Palmæ*).— In regions where bamboos are not abundant palms largely take their place as construction timbers. Besides they furnish a large number of minor forest products. Certain palms produce food, in others the nuts produce valuable oils, and some yield wax, and from others vegetable ivory is obtained. Besides the cocoanut and the date palms which are really not forest products, the following are mentioned because they produce products that are extensively exported:

1. *The ivory nut palm or vegetable ivory.* — The ivory nut is the product of a number of species of the genus *Phytelephas*. It is found in portions of Ecuador, Colombia and the Amazon. At present it is one of the principal exports of Ecuador and this country is the chief source of the nuts. Ivory nuts are principally used for buttons, but many small objects like checkers, chess, etc., are made from it.

2. *Rattans.*— The rattans of commerce are the product of several species of the genus *Calamus* and related genera. They are climbing palms, in some cases they reach the great length of 400 or more feet, and clamber from tree to tree in the forests. They are confined to the eastern tropics. They furnish the main cordage of the countries in which they grow. When exported and in the round they are used for canes, umbrella handles and for making chairs; and "split" rattans find their greatest use for seats and backs of chairs.

3. *The Oil Palm.*— The nut of this palm is extensively exported from West Africa for the valuable oil it contains. It is also found in Brazil where it was introduced from Africa. Here it is used locally only. It is the product of *Elæris guieensis* Jacq.

4. *Wax Palm.*— This palm yields a wax that comes from scales on the underside of the leaf. The palm is *Copernicia cerifera* L. and is exported mainly from northeastern Brazil.

5. *The Panama Hat Palm.*— This belongs to the *Cyclanthaceæ*, a family closely related to the palms. The species that furnishes the "straw" for Panama hats is *Corludovica palmata* R. and P. The making of Panama hats is a very important industry in Ecuador, and neighboring parts of Peru and Colombia.

XIII. Rubber, Guttapercha, Chicle.— The trees and other plants that produce the rubber of commerce are found in many parts of the tropical world. The principal one of these is *Hevea braziliensis* Muell. Arg. (*Euphorbiaceæ*), a tall tree, native of the vast Amazon region. Formerly most of the rubber of commerce was collected from this region. While the supply from the Amazon valley has not decreased, the increasing demand for rubber has been met by the extensive rubber plantation of the Malay Peninsula and neighboring regions, principally Ceylon, Sumatra, Burma and Borneo. The eastern tropics now produces fully 80 per cent of the world's supply of crude rubber. The commercial name of rubber from *Hevea braziliensis* and certain other species is *Pará rubber*. It has the local name of *seringa*. *Ceara rubber* (*Manihot glaziovii* Müll. Arg. and other species) locally known as *Maniçoba*, belongs to the same family as the Pará rubber. It comes from the dry regions of northeastern Brazil and is cultivated to some extent in other parts of the tropics. Next to *Pará rubber* in importance is the so-called Castilloa rubber, the product of *Castilla elastica* Cerv. and other species of this genus and belongs to the family *Moraceæ*. It is a native of tropical America from southern Mexico to the Amazon region. In Brazil it is known as *caucho* in distinction from the *seringa* (Pará rubber). This rubber tree has been cultivated extensively.

The *Mangabeira* rubber, mainly the product of *Hancornia speciosa* Gom. belongs to the family *Apocynaceæ*. It is found throughout the region from the territory of Acre, Brazil, to southern Paraná, Brazil, and in adjoining regions of other countries. It is cultivated to some extent but as yet the cultivated rubber is not commercially important. To this family also belong the African wild rubbers, principally species of the genera *Landolphia* and *Kickxia*.

Gutta percha is not a rubber, for it is plastic rather than elastic. It comes from trees that belong to the family *Sapotaceæ*, mostly certain species of the genera *Payena* and *Palaquium* that are found only in the Indo-Malay region. In the western tropics *balata*, mostly the product of *Mimusops balata* Gærtner., is the nearest to gutta percha. It comes mainly from the Guianas and Venezuela.

Chicle is the source of the chewing gum of commerce. It is the gum of a tree known under common names of *sapodilla* or *nispero* and other local names. This is *Achras zapota* L. The *chicle* of commerce comes mostly from southern Mexico where the tree is native. It is planted, however, in other tropical countries.

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TROPICAL FORESTS. The beauty of a tropical forest is greatly overestimated by dwellers in temperate climes. The testimony of nearly all travelers to the tropics is to the effect that nowhere did they see such an expanse of flowers and charming forests as those they had left, and they all complain of the monotonous greenness of the trees, which have never to prepare for winter. Where the trees are most immense and crowded, as in the Amazon district, and in the East Indies, the forest is lonely and silent, shadowy and sombre in the subdued light. The trunks rise without branches for many feet, tied together with creepers and lianes, in an indescribable confusion of festoons and ropes and cables, reaching from tree to tree, and to the ground; some flat, some twisted either around each other or smothering a tree; some limp and swaying, others drawn taut like the stays of a ship's mast. Many of them are climbing palms (*Calamus*) and many are armed with cruel fishhook-like thorns. The lianes, and the trees themselves, support myriads of small epiphytic or parasitic plants, ferns, fungi and countless other species. Overhead the forest is roofed by the tops of the trees and of the creepers; the foliage is sharply defined against the sky, even the finely-cut delicate leaves of the great leguminous trees characteristic of these forests. Nearly all the flowers of the deep forests are confined to this upper stratum, where the sun's rays can reach them, and they are not always easily seen, being often green or white, and inconspicuous amid the verdure. The flowers of the most tropical trees, moreover, are, even when brilliant, very fugacious; one reads of people walking through the maple leaves petals of a day, as through the maple leaves in autumn. The forest trees, however, are very prolific, and many of them bear bud, blossom, and unripe and mature fruit at the same time. The forest giants in some instances have protected themselves against the dangers of the great height and top-heaviness. Tapangs and figs have great buttresses like undulating wooden walls, others, as the screw-pines and the mangroves, perch on aerial roots, sent down from trunk and branches. The last are found along sea-shores, stepping far out into the water, backed by the screw-pines and nipa-palms and presenting an almost impenetrable front, woven into a thicket by interweaving creepers, interminably long and even thorny. It is at such edges of the forest, in clearings and along roadsides, that one sees the imagined beauty of the tropics. There the under-shrubs have a chance to grow and bloom, interspersed with graceful tree ferns and waving palms. The creepers and tree-branches descend and hang waving and blossomladen over the masses of ferns and ground plants; and there the brilliant blossom of orchid and parasite and epiphyte are visible.

African forests are often like those of temperate zones, with open glades and clumps of trees. One can hardly call the oases of palms in the deserts, forests. In Abyssinia the country has been likened to the Scotch Highlands.

It is Australia, however, which has the most peculiar tropical forest, for in spite of the fact that her gum trees are the tallest trees in the world, it is a shadeless land. So burning are the sun's rays, that the leaves of the predominating eucalyptus are so disposed as to present always their edge to the sky; the acacias have delicate compound leaves, the ti-shrub has reduced its foliage to mere needles, and the weird she-oak has dispensed with leaves altogether, string-like branchlets taking their place. The first impression of an inland Australian forest is one of monotony in color and appearance, and of burning heat and desolation heightened by the flapping strips of the bark of the gum-trees, which is cast away as northern trees shed their leaves.

TROPICS. (1) *In astronomy,* two circles on the celestial sphere, whose distances from the equator are each equal to the obliquity of the ecliptic, or 23½° nearly. The northern one touches the ecliptic at the sign Cancer, and is thence called the Tropic of Cancer, the southern one being for a similar reason called the Tropic of Capricon. The sun's annual path in the heavens is bounded by these two circles, and they are called tropics, because when the sun, in his journey northward or southward, reaches either of them, it reverses its polar movement, and turns back, or travels in an opposite direction in regard to north and south. (2) *In geography,* the tropics are two parallels of latitude, each at the same distance from the terrestrial equator, i.e., 23° 27′. The one north of the equator is called the Tropic of Cancer, and that south of the equator the Tropic of Capricorn. Over these circles the sun is vertical when farthest north or farthest south, that is, at the solstices, and they include between them that portion of the globe called the torrid zone, or the "tropics," or tropical regions, a zone almost 47 degrees wide, having the equator for its central line. The Tropic of Cancer passes through the centre of Mexico, just misses the northern point of Cuba, next invades the Sahara desert, crossing the Nile at Dendur, north of the Nubian desert, cuts Arabia centrally, then passes through northern India, China at Canton and across the island of Formosa to the Pacific Ocean, passing a little north of Hawaii. The Tropic of Capricon crosses Chile, Argentina, Paraguay and southern Brazil, strikes Africa just south of Walfish Bay, in what used to be German territory, cuts through the northern Transvaal and Portuguese East Africa to Inhambane Bay; it then passes through southern Madagascar and divides Australia.

TROPINE, $C_8H_{15}NO$, an organic basic substance obtained by action of heat and baryta on

the alkaloid atropine. Colorless crystals soluble in water and alcohol.

TROPISMS, influences exerted by their environment upon plants or animals leading to involuntary actions, or to mechanical alterations of posture, growth, etc. Such influences are exercised by chemical agents, by the earth, water, sunlight, heat, electricity, etc. See CHEMOTROPISM; GEOTROPISM; HELIOTROPISM; THERMOTROPISM, etc.

TROPPAU, trŏp'pow, Austria, capital of Silesia, on the Oppa, 78 miles northeast of Brünn. It is well built and consists of an inner town, with pleasure-grounds on the site of the former fortifications and of three suburbs. Handsome public buildings include several fine churches, an upper gymnasium, a museum, a library of 35,000 volumes, an upper real-school, and other educational institutions. The chief manufactures are woolen and linen cloth, beet-root sugar, beer, liquors, paper. A congress of sovereigns was held here in 1820, occasioned by the revolutions of Spain, Portugal and Naples. Pop. about 32,300.

TROSSACHS, trŏs'ąks, (bristles), Scotland, a romantic defile forming an approach to the Western Highlands, in Perthshire, about eight miles west of Callander. It extends for about a mile between Lochs Ackray and Katrine, winding between Ben A'an on the north and Ben Venue on the south, and confined by lofty rugged precipices covered to their summits with birch, pine and other trees. It is a favorite region for tourists and is in the locality where lived Scott's 'Lady of the Lake.'

TROTTER, Newbold Hough, American artist: b. Philadelphia, Pa., 4 Jan. 1827; d. Atlantic City, N. J., 21 Feb. 1898. He was graduated at Haverford College in 1845; engaged in business till 1858, when he turned his attention to the fine arts. When the Civil War broke out he joined the Germantown Home Guards and took part in the battle of Antietam. After the war he was appointed by the United States government to paint all the mammalia of North America in a series of volumes to be issued by the government. His best known pictures include 'Grizzly Bears'; 'Wounded Buffaloes'; 'The Last Stand' and 'Indian Encampment' and three paintings representing the progress of the means of travel in Pennsylvania during 50 years.

TROTTING. See HORSE-RACING; SPORTS: THEIR DEVELOPMENT, SPEEDS AND RECORDS.

TROTZKY, Leon (pseudonym for LEON BRONSTEIN), Russian Socialist: b. Odessa, 1879. In 1900 he was imprisoned at Odessa for participating in a revolutionary labor movement. Since early youth Trotzky has been an ardent advocate of the cause of the Social-Democratic Party, and one of the ablest agitators and orators who have written and spoken in its defense. He had traveled all over Europe before the outbreak of the War in 1914 (for instance, the social complications resulting from the Balkan Wars led him to tour the Balkans in 1912, for the purpose of social study). The outbreak of the war found him in Vienna, which he left on the same day for Switzerland, where he spent a number of months, engaged in Socialistic agitation. He wrote here an interesting pamphlet, in Russian, of which German and English translations appeared later (one under the title 'The Bolsheviki and World Peace'; New York 1918), attacking the European Socialistic parties for supporting their governments in the war; in Germany he was punished by a sentence to six months' imprisonment, pronounced in his absence. In Paris, where he next settled (1915), he edited, for the Russian colony, a Socialist weekly, *Nashe Slóvo*, but his merciless and uncompromising propaganda soon led to his exile from France to Spain (this period is interestingly covered in his 'Chapters from My Diary,' written in Russian for *Novy Mir;* English trans. in *The Revolutionary Age,* Boston 1918). From Spain he sailed, by way of Cuba, to New York, where he arrived 14 Jan. 1917. During his short stay in America he worked for several weeks as an editor on the Russian Socialist daily *Novy Mir,* devoting his evenings to lectures in Russian and German (he knows very little English and is not so good a linguist as Lenine) to New York branches of the Socialist party. Immediately after receiving news of the outbreak of the Russian Revolution, he sailed from New York for Europe on the Norwegian steamer *Christianiafjord* 28 March, but was removed 3 April from the ship at Halifax by British authorities and interned in a concentration camp at Amherst, from which he and his family were only released a month later, when they were permitted to continue their journey on the Danish steamer *Hellig Olav.* Trotzky's own description of these experiences will be found in an article 'In British Captivity,' published in *The Class Struggle* (New York 1918). After his arrival in Petrograd, Trotzky at once became one of the intellectual leaders of the Bolshevik section of the Social-Democratic party, although he had not, like Lenine, been identified with this movement from its inception in 1903. In June 1917 he established a weekly propaganda paper at Petrograd, called *Vperiod* (*Forward*), in which a number of articles and speeches in his brilliant and inspiring manner appeared. After the Bolshevik *coup d' état* of 6 Nov. 1917, Trotzky became Minister (People's Commissaire) for Foreign Affairs, while Lenine (q.v.) became Premier; later the Foreign Affairs portfolio went to Chicherin, while Trotzky headed the Department of the Army and Navy. He was one of the Russian delegates to the Brest-Litovsk conference and signed the Treaty of Brest-Litovsk with the delegates of the Central Powers on 9 Feb. 1918. A full account of his participation in the Bolshevist coup, as well as in the peace negotiations, will be found in his book 'From October 1917 to Brest-Litovsk' (New York 1919). In September 1918 reports of alleged connection between Trotzky and the German government were circulated in the American press (on these, see LENINE, NIKOLAI). Rumors of large armies raised and organized by Trotzky, possessing immense military resources, and intended to invade Germany in the support of the revolution in that country (which opened, largely as a result of Russian propaganda, in November 1918), persisted for many months in 1918–19. Consult Williams, A. R., 'The Bolsheviks and the Soviets' (New York 1918).

JACOB WITTMER HARTMANN.

TROUBADOURS, troo'ba-doorz, **The.** See PROVENÇAL LITERATURE.

TROUBETZKOY, troo-bĕts'koi, **Amélie Rives,** PRINCESS, American novelist: b. Richmond, Va., 23 Aug. 1863. She was married to John Armstrong Chanler in 1888, but secured a divorce from him on account of incompatibility, and in 1896 was married to a Russian artist, Prince Pierre Troubetzkoy. Among her works are 'The Quick or the Dead?' (1888); 'Virginia of Virginia' (1888); 'The Witness of the Sun' (1889); 'Barbara Dering' (1892); 'Tanis, the Sang-Digger' (1893); 'The Mocking of the Gods' (1902); 'Seléné' (1905); 'Augustine the Man' (1906).

TROUBETZKOY, PRINCE **Paul,** Russian sculptor: b. Intra, Italy, 1866. The son of a Russian nobleman, he worked by himself, after study under Bazzaro, and won recognition with his 'Indian Scout' in 1894. Three years later he removed to Moscow, where he was appointed professor of sculpture at the academy and from this date he did much vigorous work. Since 1905 he has lived in Paris and specimens of his art are found in many European galleries. Among his later works are the equestrian monument to Alexander III (1909, Petrograd) and 'The Daughter of Prince Scipione Borghese on Horseback' (1908). He has received numerous gold medals for his work.

TROUESSART, Edouard Louis, French zoologist: b. at Angers, 1842. He took the degree of M.D. at Paris in 1870 and served as surgeon in the French army, becoming, finally, professor of zoology in the Museum of Natural History in Paris. His publications are numerous and in 1895 he was laureate of the Société entomologique.

TROUP, troop, **George McIntosh,** American statesman: b. on the Tombigbee River, then in the Territory of Georgia, 1780; d. Laurens County, Ga., 3 May 1856. He was graduated at Princeton in 1797, was admitted soon after to the bar, and at 21 was elected a member of the State legislature. He was a representative in Congress from Georgia 1807–15, and in 1816 was elected a United States senator. From 1823 to 1827 he was governor of Georgia, and in 1829 was a second time elected to the National Senate. He was a man of great integrity, an impassioned speaker, and one of the most earnest and able of the advocates of State rights and State sovereignty.

TROUT, any of the various smaller species of fresh-water fishes of the family *Salmonidæ* (q.v.); especially a "charr" of the genus *Salvelinus,* and specifically the speckled or brook trout of eastern North America (*S. fontinalis*). The name comes originally from the European brown trout (*S. faris*). The distinction between the closely related salmon-trouts (q.v.) and the true trouts, or charrs, is most surely found in the character of the dentition. Harris has explained the difference as follows:

"Put your finger in the mouth of your capture, and if you find the vomer, a bone situated on the front part of the roof of the mouth, flat, with teeth on its body, and behind these an irregular single or double series of teeth, you hold in your hand a salmon-trout. If you find the vomer much depressed, convex and shaped like a boat, with teeth on the head of the bone, and none on its shaft, you have a charr under inspection."

All of the American charrs, except the Dolly Varden and three of the Arctic species, are natives of the waters east of the Mississippi, the common brook or speckled trout being the most widely distributed. The last species may be known at sight by the worm-like markings on the back, red spots on the sides, the large mouths, blunt snouts and dark mottlings on their dorsal and tail fins. It is the most beautiful of all the charrs by reason, as Harris writes, of the mantle of rose and violet which it wears, the mellow diffusion of which suggests and justifies the descriptive phrase so often applied to it by anglers — "the bloom of the trout." It is to be found in the streams flowing north into the Arctic Ocean, as far west as Victoria Land; ranging north and westward to the tributaries of the Great Lakes, and as far south as the southern spur of the Georgia Alleghanies. It also occurs near the sources of some of the rivers flowing into the Mississippi River and the Gulf of Mexico. The habits of trout are as various as the streams in which they dwell and the moods of the weather, and anglers find constant novelty in studying them in an effort to overcome their devious and cunning ways. Their breeding is after the general method of their race, but they never go down into salt water. They mate late in summer, and the male keeps off intruders. The female uses her tail in making the nest, whipping the gravel until a hole is made about two inches deep, and then cleans the bottom for a foot or more around the hole. When she is ready to spawn the male knows it and approaches her. The ova are then dropped and the milt is deposited upon the eggs, the male being within a few inches of his consort. This occurs in northern New England in November or early December; farther north at early dates. But many of the eggs fail to become fertilized, dropping down stream on the current; they are devoured by minnows or other fish who are lurking in the vicinity. Probably not 5 per cent of the ova dropped on natural spawning beds ever mature, while of those raised by the improved methods of the fish culturist fully 80 to 90 per cent come to maturity in the hatching ponds. Unfortunately those raised by the artificial process are generally placed, when fingerlings, in streams abounding with their natural enemies, and but a small percentage of these innocents become yearlings, at which age they are able to take care of themselves.

The charrs are also represented in Maine and New Hampshire by the Sunapee trout (*Salvelinus alpinus aureolus*), which is classified by ichthyologists as a local variety of the European charr or saibling (*S. alpinus*), peculiar in its local coloration and other characteristics. It is "brownish, sides silver-gray, with small orange spots on sides above and below lateral line; caudal grayish; belly orange; anal orange, edged before with white; ventrals orange with a white band on outer rays; no mottlings anywhere." This beautiful charr is as good to eat as it is good to catch. It reaches a weight of 10 pounds and rises freely to the fly in May and early June, after which, as the water grows warmer, it settles into deeper water, and in July and August takes a live

minnow and fights finely at a depth of 50 to 60 feet. It is connected with its European type by the arctic trout, a variety (*arcturus*) of the Arctic Coast north of Hudson Bay and variety *stagnalis* of the rivers of Greenland and Boothia.

The quasky, or blueback trout (*S. oquassa*), is the smallest and one of the handsomest of the charr trouts. It never exceeds 12 inches in length and is dark blue, the red spots small and round and usually confined to the sides of the body. Its habitat is confined to Moosehlucmaguntic Lake, of the Rangeley system, in Maine, although Professor Merriam states that identical fish have been caught in the lower Saint Lawrence River weighing six or seven pounds. The blueback lies concealed in the deep water during the greater part of the year, but about 10 October comes near the shore and ascends in shoals the Kennebago River for the purpose of spawning. Half a mile above its mouth the Kennebago receives the outlet of Lake Oquassa; the trout then leaves the Kennebago to the left and runs toward Oquassa Lake, when its voyage comes to an end. About the middle of November it goes back to Moosehlucmaguntic Lake and is seen no more until October of the next year. The blueback resembles the Sunapee trout more than any other of the charr species, yet differs from it in size, spawning habits and markings of the young. Varieties of it are known in certain lakes in northern Quebec and in the rivers of the Arctic Coast. The only trout native to the waters west of the Rocky Mountains is the red-spotted, bull or Dolly Varden (*S. malma*). It is found in the streams east and west of the Cascade Range from the upper Sacramento to Montana. It is a gaudy and large species, and good, but is not the equal of its Eastern congeners in game qualities.

Trout are justly regarded as the most interesting of all the smaller fishes that attract the angler. They are taken with the garden worm, the grub, the live minnow and the artificial fly by the method explained in the article ANGLING (q.v.). For artificial cultivation, see FISH-CULTURE.

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TROUVÈRE, troo-vâr', a member of the class of ancient poets of northern France, corresponding to the troubadour of Provence. Their productions partake of a narrative or epic character and thus contrast broadly with the lyrical, amatory and more polished effusions of their southern rivals.

TROUVILLE, troo-vēl, France, a fashionable watering-place on the English Channel, in the department of Calvados, situated at the foot of a hill on the right bank of the Touques at its mouth, near the mouth of the Seine, 10 miles south of Havre. It has a harbor, comprising an inner and an outer basin, and a splendid beach. The Casino or Salon offers all the attractions usually found in such institutions. The season is at its height in August. Boat-building and fishing are the only real industries. Pop. about 6,901.

TROVATORE, Il. Verdi's opera of 'The Trouhadour,' first produced in New York 2 May 1855, but given in Rome two years earlier. It is known the world over for its wonderful melody.

TROVER, *in law,* an action to recover the value of goods unlawfully converted by another. Originally this was an action on the case for damages against one who had found goods belonging to another and refused to give them up on demand of their owner.

TROWARD, Thomas, English New Thought apostle: b. Belgaum, India, 1844; d. 1916. During his youth and young manhood in India he imbibed the principles of Eastern philosophies and about 1904 he retired from the position of division judge which he held and came to Great Britain, lecturing and writing on the application of the underlying spiritual principles found in all religions to the active life of to-day. Though he is classed as a mental scientist and New Thought advocate he was really a sincere, educated Englishman who devoted his later days to trying to inform the Western peoples what they had to learn from Eastern philosophies. He published 'Lectures on Mental Science' (Edinburgh 1906); 'Bible Mystery and Bible Meaning' (1907); 'Dove Lectures' (1909); 'The Creative Process' (1911), etc.

TROWBRIDGE, trō'brĭj, **Edmund,** American jurist: b. Newton, Mass., 1709; d. Cambridge, Mass., 2 April 1792. He was graduated at Harvard in 1728 and for some time bore the name of Goff, which was that of an uncle. He became attorney-general for Massachusetts (1749) and was elevated to the Supreme Court (1767) where he presided over the trial of Capt. Thomas Preston and his men for firing on the people in Boston (5 March 1770). In 1772 he resigned. As executor of John Alfred, a wealthy Boston merchant, he founded at Harvard the Alfred professorships of natural religion, moral philosophy and civil polity.

TROWBRIDGE, John, American scientist: b. Boston, Mass., 5 Aug. 1843. He was graduated from the Lawrence Scientific School, Harvard University, in 1866 and served as instructor there, 1866–69. He was assistant professor of physics at the Massachusetts Institute of Technology in 1869–70 and filled the same position in Harvard, 1871–81. He was professor of experimental physics at Harvard, 1880–88 and in the year last named became Rumford professor of applied science there and in 1884 was made director of the Jefferson Physical Laboratory at the same institution. In 1878 he was elected a member of the National Academy of Sciences and later was vice-president of the American Academy of Arts and Sciences. He has published 'The New Physics' (1884); 'What is Electricity?' (1896); 'The Resolute Mr. Pansy' (1897); 'Three Boys on an Electric Boat' (1894); 'The Electrical Boy' (1891); 'Philip's Experiments, or Physical Science at

Home' (1898) and many papers on physics and more especially on electricity.

TROWBRIDGE, John Townsend, American author: b. Ogden, Monroe County, N. Y., 18 Sept. 1827; d. 12 Feb. 1916. He attended a district school and by doing farm chores managed to obtain sufficient funds to attend a classical school at Lockport, N. Y., for one term. Then he went to Illinois for a year, teaching school in the winter and working as a farmhand in summer. Returning to Lockport he taught school for a few months and then decided to devote himself to literature, for which he early had evinced a fondness. At 19 he went to New York City. His literary aspirations found no encouragement, and after a year of futile effort he removed to Boston. There he soon became widely known as a writer of stories and sketches under the pen name of Paul Creyton. In his first book, 'Father Brighthopes' (1853), Mr. Trowbridge caught the fancy of the boys of that day, and with a long series of volumes he held juvenile interest unabated through succeeding generations. These included 'The Drummer Boy' (1863); 'Cudjo's Cave' (1863); 'The Three Scouts' (1864); 'Neighbors' Wives' (1867); 'Coupon Bonds and Other Stories' (1872); 'The Silver Medal' (1908); 'A Pair of Madcaps' (1909); 'The Jack Hazard Series'; 'Toby Trafford Series'; 'Start in Life Series' and 'The Tide Mill Series.' For many years he edited *Our Young Folks,* which numbered among its contributors Dickens, Whittier, Mayne Reid, Harriet Beecher Stowe and Louisa M. Alcott. Although his verse does not show the enduring excellence that marked his boys' books, 'Darius Green and His Flying Machine' (1870) proved him to have been unconsciously a prophet with honor. Consult his autobiography, 'My Own Story' (1903).

TROWBRIDGE, Samuel Breck Parkman, American architect: b. New York, 20 May 1862. He was graduated at Trinity College, Hartford (1883), at Columbia School of Architecture (1886) and then studied abroad. After graduation from the School of Architecture he was sent by the Archæological Institute to superintend the erection of the American School of Classical Studies at Athens, Greece. Later he became a member of distinguished New York firms of architects and established a high standard in his profession. He was appointed by President Roosevelt as chairman of the National Council of Fine Arts. He is a member of many foreign societies and was appointed a Chevalier of the Legion of Honor (1910) and elected to the National Institute of Arts and Letters (1915).

TROWBRIDGE, William Petit, American engineer: b. in Oakland County, Mich., 25 May 1828; d. New Haven, Conn., 12 Aug. 1892. He was graduated at West Point in 1848, served there during the last year of his cadetship as assistant professor in chemistry, later as assistant in the astronomical observatory, and in 1851 was assigned to the coast survey. His work on the Pacific Coast in 1853 embraced a series of magnetic and tidal observations covering a distance of over 1,300 miles, from San Diego to Puget Sound. In 1860, at Key West, Fla., he superintended the erection of the first permanent self-registering magnetic observatory in the United States. After the outbreak of the Civil War he furnished minute descriptions of the rivers, harbors and inlets of the Southern coast to the War Department, and later was stationed at New York, where he superintended the accumulation and transmission of field-supplies. Besides these duties he superintended the construction of fortifications at Willett's Point and at Governor's Island, and the repairs of Fort Schuyler. In 1870 he became professor of mechanical engineering in the Sheffield Scientific School at Yale, and later held a professorship in the Columbia School of Mines, and at both institutions rendered an efficient service in the establishment and development of new courses of instruction. To him belongs the credit for the design of the first cantilever bridge, details of which are given in his work, 'Proposed Plan for Building a Bridge across the East River to Blackwell's Island' (1869). A company was formed to carry out the scheme, but the financial crisis of 1873 put an end to the plan. He was the inventor of a coil-boiler, utilizing forced circulation of water, a principle that later came into use. His publications include 'Heat as a Source of Power' (1874) and 'Turbine Wheels' (1879).

TROY, troi, or **ILIUM,** a famous ancient city in the northwestern part of Asia Minor, the capital of the Troad, a region lying on the coast of the Ægean Sea, at the entrance to the Hellespont (Dardanelles). The fame of Troy rests upon the two Homeric epics, the Iliad and the Odyssey (see HOMER), which, incidentally to their main themes, give an account of the long war in which the city was finally destroyed. The date of the latter event is generally placed at 1184 B.C. The cause of the war was the abduction of Helen, the wife of King Menelaus of Sparta, by Paris, son of the Trojan king, Priam. Almost all the states of Greece proper united to avenge the insult, and, under the leadership of Agamemnon, king of Mycenæ, landed on the Trojan coast with a large army. After besieging the city in vain for 10 years, they finally took it by a stratagem. They placed outside the walls a large wooden horse in whose interior a number of Greek heroes were concealed, and the rest of the army then retired to the ships as if they had given up the siege. The Trojans in exultation dragged the horse within the walls, and during the night the Greeks came forth and were joined by the main army which had returned from the ships. The city was now given over to fire, plunder and massacre. Among those who escaped was Æneas, who reached Italy, and, according to the legend, was the ancestor of the first Roman kings. The Homeric legend of Troy is believed by modern scholars to be woven around a nucleus of fact. About the 6th century B.C. a new Troy, *Ilium Novum,* was founded on what has ever since been believed to be the site of the Homeric city. The place is now called Hissarlik, and lies a few miles from the southwestern entrance to the Dardanelles. Here Dr. Schliemann began excavations in 1871 and again in 1890, and his researches prove that the site has been occupied successively by seven cities. The second of these from the bottom bears marks of having been destroyed by a conflagration. Within its walls were found the ruins of a palace, and a number of gold and silver ornaments. Dr. Schliemann

considered this second city to be the city of Priam and the Homeric legend, but later excavations have shown that only the sixth (the fourth from the top, later discoveries having increased the total number to nine) city can be referred to the period described in Homer. Of this city nothing remains except portions of the colossal and well-built outer walls. Consult Schliemann, 'Trojanische Altertümer,' 'Ilios,' 'Troja'; Schuchardt, 'Schliemann's Ausgrabungen'; Schmidt, 'Schliemann's Sammlung trojanischer Altertümer.'

TROY, Ala., city, county-seat of Pike County, on the Central of Georgia and the Alabama Midland railroads, about 50 miles south by east of Montgomery. It is in an agricultural region in which cotton is one of the principal products. It has been incorporated since 1843. Its industries are connected chiefly with the cultivation and marketing of cotton. The educational institutions are Troy Industrial Academy for colored pupils and public schools. There are two private banks. Pop. 6,000.

TROY, Mo., city, county-seat of Lincoln County, on the Saint Louis and Hannibal Railroad, about 50 miles northwest of Saint Louis. It is in a region rich in deposits of glass sand, iron ore and coal, and surrounded by fertile agricultural lands. The chief manufacturing establishments are flour mills, butter and cheese factories and tobacco factories. The shipments are chiefly farm and dairy products, tobacco products and livestock. There is one high school, public elementary schools and a library. There are two State banks. Pop. about 1,120.

TROY, N. Y., city, county-seat of Rensselaer County, on the east bank of the Hudson, 150 miles north of New York, 191 miles west of Boston, 235 miles south of Montreal, Canada, and 296 miles east of Buffalo. It is at the head of tidewater navigation on the Hudson River, and the New York State Barge Canal system has its main outlet opposite the city. Through the State Barge Canal, Troy has connection with the Great Lakes and the Northwest, while the Champlain branch of the canal gives an opening to Canadian territory. Steamers and barges ply regularly between Troy and New York and the intervening cities. The United States has spent large sums of money in improving the channel in the river so the larger vessels for the new canal system have no difficulty in reaching the canal. The steam railroads operating in Troy are the New York Central, the Delaware and Hudson, the Boston and Maine and the Rutland. There are also long-distance trolley roads, some of them maintaining freight service, that extend through the Hudson Valley to Lake George on the north; through the Mohawk Valley on the west; south through the Hudson Valley and eastward to the manufacturing villages along the Wynantskill Creek, a distance of 12 miles. These transportation facilities give Troy great advantages as a manufacturing and distributing point, so there are built up opposite the city, not half a mile from its borders, but not included in its population, the cities of Watervliet and Cohoes and the villages of Waterford and Green Island. With those places Troy is connected by bridges over the Hudson River, there being four. There is a modern steel bridge across the Hudson at Congress street, which carries foot passengers, vehicles and street cars. Built as a toll bridge, the State of New York acquired it under condemnation proceedings.

Trade and Manufactures.— Troy ranks ninth in population among the cities of the State, but fifth in industries. The chief manufactures are collars and cuffs — about 90 per cent of all the collars and cuffs made in the United States are made in Troy. So great has this industry become in this city that special machinery has been invented for it and is manufactured here. It has an extensive system of laundries, and for this industry special machinery has also been invented and is manufactured in this city. It is noted for its high grade of merchant iron; its valves and hydrants (valves of 96 inches inside diameter are now made here). Other manufactures are stoves, knit goods, paper, cars, electrical machinery, mechanical and engineering instruments, bells, paints, clay products, floor cloths, brushes, tobacco, cigars, carriages, scales, currency ink, horseshoes, ranges, hydrover tractors, blowers and fans, fishline, twine, shirtwaists, cotton waste, knit goods, shirts, thermometers, stamped tinware, metal stove-front bars, marine engines, beaded bags, anchor chains, etc. The famous machine-made horseshoe invented by Henry Burden is manufactured here. He also made the largest over-shot water-wheel yet made in America. It is 60 feet in diameter. The guns for coast defense of the United States are made at the government arsenal at Watervliet, opposite Troy. Troy and its environs are now undergoing a great industrial expansion, the first definite movement of this sort in the recent history of the city. During the war, the Watervliet arsenal was enlarged until it became the largest government arsenal in the world for the production of heavy ordnance. The arsenal is being enlarged to provide in peace times the nucleus for adapting ordinary industries to the production of ordnance in war periods in addition to its own production. This is an advanced step in government policy. Open hearth steel and producer gas plants are being erected and the city and district seem destined to obtain their former high standing as an iron and steel centre. The most significant development is the purchase of the northern end of Green Island by Henry Ford and Son of Detroit, as a site for a steel factory and farm tractor plant to be operated largely by power from the government dam across the Hudson at Troy. In addition to its great collar and shirt factories, Troy has become important for the manufacture of women's shirtwaists. There is a State dam across the Hudson at Troy and factories are operated by the power here obtained. There is considerable water power on the Wynantskill and Poestenkill creeks; each stream has a fall of about 200 feet in the hills east of the city.

The city contains more than 258 concerns engaged in manufacturing and employing about 26,636 wage-earners and producing annually over $60,000,000 worth of goods.

The city is situated on a narrow alluvial plain, extending north and south along the river front for six and one-half miles. From the plain, and paralleling the river, a range of hills arises, in some places to a height of 500 feet. While most of the city is confined to the level ground, the finest residential part is on

the hills, of which the most prominent is Mount Ida. On a spur of this hill, jutting out boldly into the centre of the city, stands Prospect Park. The waterworks reservoirs are located on the hills east and northeast of the city. A new gravity system has been installed with a daily capacity of 18,000,000 gallons and the old gravity systems supplement this with 9,000,000 gallons.

There are a number of cemeteries in Troy, but Oakwood, containing 400 acres, crowns one of the hills east of the city, overlooking the valley of the Hudson opposite the delta of the Mohawk. The cemetery plateau is 300 feet above the plain, to which it inclines with precipitous sides. The Hudson is in sight for miles, while the Mohawk breaks through the hills to the west, tumbles over a rocky precipice 60 feet in height, then passes peacefully through its four mouths into the Hudson. Oakwood cemetery is a resting place for three distinguished national heroes.—Gen. John E. Wool, the commander-in-chief of the American forces in the Mexican War, Gen. George H. Thomas, "the rock of Chickamauga," and Gen. J. B. Carr of Civil War fame. General Wool's monument is a monolith 60 feet high, and weighing more than 100 tons. The Earl Crematory, a prominent object in Oakwood, is a memorial building erected at great cost, and contains, aside from a perfect incinerating apparatus, some fine mosaics, rare marbles and rich stained glass. The streets of Troy are regularly laid out until the river front is reached, when the streets are intersected by River street, which follows the curvatures of the Hudson River. These irregular intersections form triangles misnamed squares. In one of these stands the Soldiers' and Sailors' monument, 93 feet high, costing over $50,000. On the lower sides of the stone work are bronze bas-reliefs representing battle scenes; one of them being a representation of the engagement between the *Monitor* and the *Merrimac*. This is a particularly appropriate scene because most of the armor plate of the *Monitor* was rolled in Troy. There are 100 miles of streets in Troy, of which 65.22 miles are paved.

Buildings.— Troy has many public buildings of note and many of its citizens have built beautiful and substantial memorials for charitable and educational work. Troy has developed as an educational centre during recent years through the endowments of Mrs. Russell Sage, the widow of the noted financier, Russell Sage, who was a former resident of Troy. The gifts of Mrs. Sage have given an impetus to old institutions and enabled them to add extensions. The Emma Willard School has been removed from the central section of Troy and located in a new group of fine buildings, in the eastern section of Troy on the hills, overlooking the Hudson Valley and the Berkshires. The former home of the Emma Willard School has been converted into a women's college of applied arts and has an enrolment exceeding 300. Another educational enterprise which has done much to make Troy famous is the Rensselaer Polytechnic Institute (q.v.), an excellent school of civil engineering. Its graduates have designed some of the greatest engineering works of modern times. Extensive additions have been made to the Rensselaer Polytechnic Institute through the aid of Mrs. Sage. It enrolls about 1,000 students. The post office, a fine granite structure; the savings bank building, which cost about $600,000, and which contains a fine Music Hall with seating capacity of 1,300; the public library, white marble in the Italian Renaissance style, cost about $300,000; the courthouse, city hall, Rowe Memorial, Young Men's Christian Association, Young Women's Christian Association; R. P. I Alumni, Ilium and other commercial buildings, the Union station, a high school and the Rensselaer Hotel are among the city's notable structures. The leading charitable and religious institutions are the Troy Orphan Asylum, a group of buildings of the Elizabethan style of architecture; three Roman Catholic orphanages, a reformatory, a home for the aged, three hospitals, several very fine churches, and the Salvation Army Temple. The public and parish school buildings recently erected are all models of completeness and beautiful architecture.

Finances.— The assessed valuation of taxable property is $61,194,631, of which $55,700,114 is for real estate, and the net bonded debt $4,379,620. The maintenance and operation of the city in 1919 was $1,256,360. There are several national banks, one State bank and two trust companies. There is one savings bank and three building and loan associations.

Government.— Troy is governed as a second class city of the State of New York and in addition to general State laws retains features of its old charter. The city is well governed, the principal problem being the comparatively great length, narrow width and steep grade of some streets leading to the residential districts on the heights to the East. The State of New York and city of Troy are co-operating in the erection of an extensive system of docks to serve as terminals for traffic created by the New York State Barge Canal system.

History.— The site of Troy was the seat of several farms, in 1786, when Albany had been called a city for a hundred years. The Mohegan Indians formerly had a fortified village on the site of Troy at a point just north of the Poestenkill Creek. The Mohawk tribe of Indians had a palisaded village on the west side of the Hudson River on an island formed by the third and fourth branches of the Mohawk River at its mouth. Hostilities broke out between tribes, in which the Mohawks were successful, and the Mohegans were finally driven to the Connecticut River. The Dutch families, who afterward took possession of this ground on the east side of the river, found a natural meadow land, and they called it "Pafraets Dael," "The paradise of a lazy man."

The islands forming the delta of the Mohawk River, opposite Troy, were the scene of much activity during the Revolutionary War. The American army encamped here to obstruct the march of Burgoyne. The island which was formerly the site of the Mohawk Indian village, above referred to, was fortified on its north side by earthworks, under the superintendence of Thaddeus Kosciuszco. Gen. Philip Schuyler commanded the American troops, with his headquarters at Van Schaick's house, which is still standing. The fortifications may yet be plainly seen. From these islands the American

army marched north under General Gates, who succeeded Schuyler, and soon afterward fought the British at Schuylerville in what is known as the battle of Saratoga.

Three miles above the site of Troy stood a village called New City, afterward Lansingburg. In 1787 New City had nearly 500 inhabitants, Albany had about 3,000, and Troy consisted of a few farmhouses. The deeper channel in the river at Troy made navigation so much easier than at New City that the enterprising settlers who began to arrive from New England, seeing its advantages, located here. The settlement grew rapidly, being known at this time as "Van der Heyden's." In 1789 the settlers changed the name to Troy. The falls on the Poestenkill Creek were taken advantage of, and three mills were here erected, a saw mill, a grist mill and a paper mill; the last, the first of its kind in northern New York, was built in 1792. In 1808 a rolling mill was established on the Wynantskill Creek. Troy soon outstripped Lansingburg, and in 1793 the State legislature decided on Troy as the county-seat of Rensselaer County.

During the War of 1812 the merchants of Troy supplied large quantities of provisions to the American army. Samuel Willson, who slaughtered cattle and packed beef in Troy, supplied his beef to the army "packed in full bound barrels of white oak." It soon became known as "Uncle Sam's," as Samuel Willson was familiarly called, and from this grew the well-known appellation, "Uncle Sam," as applied to the United States.

The charter incorporating Troy as a city was passed by the legislature in 1816.

The State dam was constructed across the Hudson River at Troy in 1823. This marks the tidal point of the Hudson River. At this time commerce with New York was mainly by sloops, of which 39 were recorded as owned by Troy merchants. In addition to its rapidly growing commerce, Troy now began to acquire fame as an educational city; the Emma Willard Seminary, established in 1814 and removed to Troy two years later, was developing a national fame; and in 1825 the Rensselaer Polytechnic Institute was opened. The population of Troy was now 7,859. The population and industries increased rapidly, and it became an important manufacturing centre. Its collar and cuff and iron industries gave its growth a great impetus. Its remoteness from the mines has caused it to lose its supremacy in the iron industries, but the collar and cuff industry has steadily increased. Industrially, the city is noted for having a group of precision industries, that is, works where machining is done to a standard of one one-thousandths of an inch instead of the usual machine shop standard of one one-hundredths-inch. This was the determining factor in the government enlarging the Watervliet arsenal during the war and after the war. Precision trained mechanics of this sort are found in few other centres in America. Troy has had several destructive fires. The most notable was the one of 10 May 1862, when the total value of property destroyed was $2,677,892; about 800 buildings were burned.

The village of Lansingburg and the city of Troy gradually grew toward each other until the dividing line was not apparent to the eye, yet each maintained its separate government. In 1900 an act was passed by the legislature annexing Lansingburg and other outlying territory to the city of Troy. This act did not take effect until 1 Jan. 1901, too late to receive notice in the United States census of 1900. However, an enumeration was taken by the census officials, as shown in the census reports, giving the population of Greater Troy as 75,057. The population at present is estimated at 80,000. Consult Weise, 'Troy's One Hundred Years.'

ARTHUR J. BURCH,
Secretary of Troy Chamber of Commerce.

TROY, Ohio, village, county-seat of Miami County, on the Miami River, the Miami and Erie Canal, and on the Cleveland, Cincinnati, Chicago and Saint Louis and the Cincinnati, Hamilton and Dayton railroads, about 20 miles north of Dayton. It was located in 1807 in an agricultural and stock-raising region, and has considerable manufacturing interests, being incorporated in 1890. The principal manufactories are planing mills, foundries, bent wood and wagon factories, and a flour and grist mill. There is considerable trade in farm and dairy products, and in the local manufactures. The educational institutions are a high school, Saint Patrick's Academy, public and parish schools and a public library. The two banks have a combined capital of $300,000. Pop. 6,122.

TROY WEIGHT. See WEIGHTS AND MEASURES.

TROYES, trwä, France, capital of the department of Aube, and formerly of the province of Champagne, 103 miles east-southeast of Paris by rail, on the left bank of the Seine. Many of the streets are narrow and irregular, and lined with mediæval timber houses. The principal edifices are the cathedral, a splendid specimen of florid Gothic; the churches of Saint Urbain, of Saint John and of Saint Madeleine, in the flamboyant style; the *hôtel-de-ville,* the prefecture, the hospital, museum, *palais de justice* and public library, containing 140,000 printed volumes and nearly 15,000 manuscripts. The manufactures consist of cottons, woolens, hosiery, soap, artificial flowers, paper, gloves, etc. There are numerous worsted and cotton mills. The division of the Seine here into several arms facilitates local water transportation. It carries on an important trade in grain, wine, brandy, colonial produce, famous sausages, hemp, wax, wool, wood, iron, lead, zinc, etc. The town was in existence previous to the conquest of Gaul by the Romans, by whom it was called Augustobona. The Treaty of Troyes between Charles VI and Henry V of England was concluded in 1420. Nine years later the English were expelled by Joan of Arc. The revocation of the Edict of Nantes in 1685 intertered with trade, so the population was reduced from about 40,000 to 24,000. It has since recovered, and in 1911 was 55,486.

TROYLUS AND CRYSEYDE. One of Geoffrey Chaucer's poems, written about 1380 and supposed to be a translation from Boccaccio. The episode first appears in a 12th century romance. See TROILUS AND CRISEYDE.

TROYON, trwä-yôn, **Constant,** French painter: b. Sevres, 25 Aug. 1810; d. Paris, 21 Feb. 1865. He was one of the first and greatest of the French "Naturalists," and was

trained as a painter on porcelain. His pictures rank high among those of his contemporaries, and his cattle and landscapes rival the best productions of the Dutch school. He excelled in natural presentation of the familiar views of cattle in the fields and on the farms and was very prolific. The large French galleries all have numerous samples from his brush. There are several good examples of his work in the New York Metropolitan Museum, and among them 'Cow,' 'On the Road' and 'Landscape and Cattle.' Consult Dumesnil, 'Constant Troyon' (1888), and Hustin, 'Les Naturalistes Français' (1893). The Brooklyn Institute, the Art Institute in Chicago, the Corcoran Gallery in Washington and others in Philadelphia and San Francisco have many of his canvasses. Consult Hustin, A., 'Constant Troyon' (Paris 1893); Gansel, W., 'Cosot und Troyon' (1906).

TROZO, trō'thō, or **SAN JOSÉ,** sän hō-sā', Philippines, a suburb of the city of Manila, occupying the centre of the northeast quarter of the city, southeast of Tondo. The people are largely engaged in the mechanical industries; there are also a few Chinese and native residents of the upper class.

TRUANT SCHOOL, the popular name for a school or reformatory for truant or vagabond children; organized under State auspices and managed by the State educational officials. In 1850 Massachusetts passed a law permitting the punishment of truancy by confinement. New Hampshire, New York, Rhode Island and Connecticut made similar legislation before 1865, and New York and other cities made like provisions; but where the law was not a dead letter, habitual truants were classed as "juvenile disorderly persons" and were sent to almshouses or reformatories. In 1880 Massachusetts began to establish county schools for truants, and several were established in large cities elsewhere. Many States and cities provide for the arrest of truants and their being replaced in the public schools, a method followed in Continental Europe, where there are no institutions exactly parallel to the American truant school. In Great Britain there are two provisions for school offenders, the day industrial and the truant schools, based on the Industrial Schools Act of 1866, for "any child found habitually wandering or not under proper control, or in the company of rogues, vagabonds disorderly persons, or reputed criminals"; or any child whose parents neglect to provide for its instruction. See CHILDREN'S COURTS; PUBLIC SCHOOLS.

TRÜBNER, Nicholas, London publisher: b. Heidelberg, Germany, 1817; d. London, England, 1884. He learned his trade abroad and on coming to London was employed by Longmans for a time but in 1851 entered in business for himself and speedily became the head of Trübner and Company. He published a 'Bibliographical Guide to American Literature' (1855), which was enlarged four years later; also 'Trübner's Oriental Series' and the 'British and Foreign Philosophical Library.'

TRUCE, a temporary suspension of hostilities between two armies or states for negotiation or other purposes. It has almost the meaning of armistice, but suggests a more local understanding. A truce may, however, apply either to all the operations of a war or to those at one place only, as a truce after a battle for carrying off the wounded. A truce to become generally binding requires the sanction of the commander-in-chief, it may be ended before the period previously agreed upon if due notice be given to the opposite party.

TRUCE OF GOD, the title given in the Middle Ages to a limitation of the right of private warfare introduced by the Church in order to mitigate an evil which it was unable to eradicate. This truce of God provided that private feuds should cease, at least on the holy days, from Thursday evening to Sunday evening in each week; also during the whole season of Advent and Lent and on the octaves of the great festivals. The salutary regulation was first introduced in 1033 in Aquitaine, then in France and Burgundy. Under William the Conqueror it was introduced into England, and in 1071 into the Netherlands. At many councils it was a chief subject of discussion and was enjoined by special decrees. Whoever engaged in private warfare on the prohibited days was excommunicated. The truce of God was also extended to certain places, as churches, convents, hospitals, churchyards, etc., and certain persons, as clergymen, peasants, merchants, pilgrims and, in general, all defenseless persons. At the Council of Clermont (1095) it was made to include all Crusaders. This institution died out when the rulers of the various countries became strong enough to curb effectually their turbulent and powerful subjects.

TRUCK, Motor. See MOTOR TRUCK.

TRUCK ENGINE. See INTERNAL COMBUSTION ENGINE.

TRUCK FARMING. See HORTICULTURE.

TRUCK SYSTEM, the practice of paying the wages of workmen in goods instead of money. This practice has prevailed in various places and trades, particularly in the mining and manufacturing districts of Great Britain, and the workmen have often had to pay exorbitant prices for their goods. Several acts of Parliament have been passed with the object of abolishing the system. In the United States the system was common in the Pennsylvania coal fields where miners are paid in store checks; at the end of the week or month their wages have been consumed by rent, supplies, groceries and other necessaries of life. In most of the States it is now prohibited by law.

TRUCKEE, trŭk-ē', a river, the outlet of Lake Tahoe in California. It flows north, then enters Nevada and flows east, then north, entering Pyramid Lake, which has no apparent outlet. The river is about 100 miles long. Reno, Nev., is the most important town on the river.

TRUDEAU, Edward Livingston, American physician: b. New York, 5 Oct. 1848; d. 15 Nov. 1915. In 1871 he was graduated at the College of Physicians and Surgeons, New York, and established his practice in that city. Attacked by tuberculosis he removed to the region of Saranac Lake in 1873, and there remained until his death. In 1884 he founded a sanitarium for the treatment and cure of incipient tuberculosis among the poorer classes. For many years Dr. Trudeau followed the open-air method of treatment, and in 1894

founed the Saranac Laboratory for the study of tuberculosis, the first of its kind in America. Robert Louis Stevenson was among his most noted patients. He was recognized in America and abroad as the foremost authority on tuberculosis and on methods for combating it. In 1905 he was president of the Association of American Physicians, and five years later of the Congress of American Physicians and Surgeons. He became first president of the National Association for the Study and Prevention of Tuberculosis. Consult his 'An Autobiography' (Garden City, N. Y., 1916) and Chalmers, Stephen, 'The Beloved Physician' (Boston 1916).

TRUE, Alfred Charles, American educator and agriculturist: b. Middletown, Conn., 5 June 1853. He was graduated at Wesleyan University, Connecticut, from which he also received a degrees of D.Sc., and after a graduate course at Harvard, 1882–84, was an instructor at Wesleyan, 1884–88. He then entered the United States Department of Agriculture; was successively editor, vice-director and director (1888–1915) of the office of experiment stations, and became director of the State Relation Service in 1915. For many years he was editor-in-chief of the *Experiment Station Record* and the *Experiment Station Work;* and had charge of investigations in irrigation, drainage and human nutrition. He still has supervision of the Federal work and expenditures for agricultural experiment stations in all the States and in Alaska, Porto Rico, Hawaii and Guam, and for co-operative extension work in agriculture and home economics throughout the United States under the Smith-Lever Act of 8 May 1914, together with investigations in home economics and agricultural education. In 1914 he was president of the Association of American Agricultural Colleges and Experiment Stations, and since 1902 has been dean of the Graduate School of Agriculture maintained by the association. He is the author of monographs on agricultural experiment stations in the United States and on agricultural education.

TRUE, Charles Kittredge, American educator: b. Portland, Me., 14 Aug. 1809; d. Brooklyn, N. Y., 20 June 1878. He was graduated at Harvard in 1832, was subsequently pastor of several Methodist churches and principal of the Amenia Seminary. In 1849 he received the degree of D.D., from Harvard, and was professor of moral philosophy at Wesleyan University (1849–60). He was a ready writer and produced many books, notably 'Life and Times of John Knox' (1874); 'The Thirty Years' War' (1879), and the 'Life of Captain John Smith' (1882).

TRUE, Frederick William, American biologist: b. Middletown, Conn., 8 July 1858. He was graduated at the University of the City of New York in 1878; entered the government service in 1878; and was expert special agent on fisheries for the 10th census, 1879. He was curator of the department of mammalia at the United States Museum, 1881–92, an executive curator, 1892–97. In the year last named he was appointed head curator of the department of biology at the United States National Museum. He has written 'Review of the Family of Delphinidæ'; 'Whalebone Whales of the Western North Atlantic' (1904); 'Observations on Living White Whales' (1911), etc.

TRUE, Rodney Howard, American botanist and physiologist: b. Greenfield, Wis., 14 Oct. 1866. His education was secured at the University of Wisconsin and at Leipzig, where he took his Ph.D. degree (1895). He taught in the schools of Wisconsin, was made a lecturer in botany in Harvard in 1900–01, since which time he has been in charge of physiological investigations for the United States Department of Agriculture. His writings though voluminous are chiefly contributions to scientific journals.

TRUEBA Y COSÍO, Telesforo De, Spanish author: b. Santander, Spain, 1798; d. Paris, 1835. He was educated in a Catholic college in England, and served as an attaché to the Spanish legation there until 1822. Returing to Spain he founded an academy of the younger generation of poets and wrote two comedies which rank with the best productions of the time. Subsequently he fled for political reasons to London, where he gained repute as a fluent English writer. His greatest success was won by his description of manners, 'Paris and London' (1831). He returned to Spain in 1834, and was elected to the Cortes.

TRUEBLOOD, Benjamin Franklin, American publicist: b. Salem, Ind., 25 Nov. 1847; d. Newton Highlands, Mass., 26 Oct. 1916. He was graduated from Earlham College, Richmond, Ind., in 1869; entered the ministry of the Society of Friends the same year, and was president of Wilmington (Ohio) College, 1874–79. He was president of Penn College, Oskaloosa, Iowa, 1879–90, and received the following honorary degrees: LL.D., Iowa Wesleyan University, 1887; LL.D., State University of Iowa, 1890; LL.D., Baylor University, Waco, Tex., 1907. Dr. Trueblood was secretary of the American Peace Society in Boston, 19 years, in Washington, four years; was editor of the *Advocate of Peace,* 1892–1915, and published 'The Federation of the World' (1899). He made translation of Kant's 'Zum ewigen Frieden' (1897); also published many pamphlets, numerous articles in magazines, gave many lectures on international subjects, participated in International Peace Congresses and many other conferences. On account of broken health he resigned the secretaryship of American Peace Society, May 1915, and was elected honorary secretary of the American Peace Society.

TRUFFLES, subterranean saprophytic fungi (q.v.), chiefly European *Tuberaceæ,* the mycelia of which grow in leaf-mold. Their fructifications are edible, solid tuber-like bodies, ranging from the size of a filbert to that of a potato, and ultimately set free by the decay of the mycelium. There are several species of truffles, which are not only nutritious but very much esteemed for their aromatic flavor and piquant taste, and are used in fine cooking, pâtés, etc. Although white truffles are somewhat in demand, it is the black or queen truffles (*Tuber cibarium, T. æstivum,* or *T. melanospermum*) of England and France, which are in most demand, those of Perigord being considered as the finest. These are of varying

size, and have a gray or seal-brown or nearly black skin, which is pebbled, or warty, with small angular protuberances. The firm interior, with such a texture as has an immature puff-ball, is dark-brown, somewhat mottled by reason of its chambered structure, and reticulated with the white films of hyphæ. Truffles are practically never cultivated, in spite of various attempts, but are occasionally cared for *in situ*. They thrive best in limestone soils, and in such light, moist, but well-drained woodlands, as are frequented by the various species of trees near which the truffles prefer to exist — possibly on their decaying roots. The tubers are entirely subterranean, occurring either deep in the ground or close to the surface, ripen in winter and are dug out, either laboriously by unaided man with a sharp spud, or by the aid of dogs and pigs. The latter are commonly used in Perigord, their rooting instincts and fine nose for scent being turned to account. A trained sow will sniff the peculiar pervasive odor exhaled by a ripe tuber, and will make directly for it, either laying it bare or uprooting the solitary tuber, to be rewarded with an acorn or chestnut. Good intelligent sows in a prolific forest will unearth 10 or 12 pounds of truffles in a day, which will bring in a good price. Dogs are also used in the same manner, especially by poachers. The red truffle (*Melanogaster variegatus*) is, like the false truffle (*Scleroderma vulgare*), allied to the puff-balls; and *Terfezia leonis* is the white, potato-like truffle of Italy. The African species of *Terfezia* and *Tirmannia*, somewhat inferior in quality, in some parts of Algeria and Tunis form an important food-supply for the people.

TRUJILLO, troo-hēl'yō, or **TRUXILLO,** Peru, the capital of the department of Libertad, situated close to the Pacific Coast, 320 miles northwest of Lima. It is partially surrounded by ancient adobe walls, believed to be 250 years old. It has a cathedral, a national college and a university. There are interesting ruins of a former great city four miles to the north. The port is Salavery, connected with the city by a short railroad. Many bananas are shipped north. Pop. about 8,000.

TRUMBITCH, Ante, Foreign Minister of the Serb-Croat-Slovene kingdom (1918), was born Spalato, Dalmatia, and was for many years mayor of that city. A prominent lawyer, he became president of the Dalmatian Provincial Diet and a Dalmatian deputy to the Austrian Reichsrat. He escaped from Austria on the outbreak of the war and assisted to form the Southern-Slav Committee, of which he was elected president. In July 1917 he concluded the Declaration of Corfu with Serbia — the preliminary charter of Southern-Slav unity under the Karageorgevitch dynasty. In March 1918 he also concluded the Italo-Southern-Slav agreement with Italy and was appointed Foreign Minister of the new kingdom on 22 Dec. 1918.

TRUMBULL, trŭm'bŭl, **Annie Eliot,** American novelist, daughter of J. H. Trumbull (q.v.): b. Hartford, Conn., 2 March 1857. She was graduated from the Harvard High School in 1876 and has published 'A Cape Cod Week' (1898); 'Rod's Salvation' (1898); 'Mistress Content Cradock' (1899); 'Life's Common Way' (1903) and other works.

TRUMBULL, Gurdon, brother of H. C. Trumbull (q.v.), American artist: b. Stonington, Conn., 5 May 1841; d. Hartford, Conn., 28 Dec. 1903. He learned his art in Hartford and New York. It was in studies of fish that he achieved his reputation and his most noted works were 'Over the Fall'; 'A Plunge for Life' and 'A Critical Moment.' He was the illustrator of the work of his sister, Mrs. Annie T. Slosson, 'The China Hunters' Club,' and was author of the work entitled 'Names and Portraits of Birds.'

TRUMBULL, Henry Clay, American author and editor: b. Stonington, Conn., 8 June 1830; d. Philadelphia, Pa., 8 Dec. 1903. He was educated at Williston Seminary, East Hampton, Mass., and at first engaged in railroad business at Hartford, but in 1858 became State missionary of the American Sunday School Union for Connecticut. He was ordained to the Congregationalist ministry in 1862, entered the Union army as chaplain, and served through the war with the exception of a portion of 1863, when he was held a prisoner by the Confederates. He was appointed missionary secretary for New England of the American Sunday School Union in 1865, normal secretary in 1871 and in 1875 he removed to Philadelphia. He purchased the chief interest in the Philadelphia *Sunday-School Times* in that year and was its editor until his death. He discovered the site of Kadesh-barnea on the southern border of Palestine while on a tour of the East in 1881. His works include 'The Sabbath School Concert' (1861); 'The Knightly Soldier' (1865); 'Kadesh-barnea' (1884); 'Studies in Oriental Social Life' (1894); 'War Memories of an Army Chaplain' (1898); 'Old Time Student Volunteers' (1902), etc.

TRUMBULL, James Hammond, American philologist, brother of H. C. Trumbull (q.v.): b. Stonington, Conn., 20 Dec. 1821; d. Hartford, Conn., 5 Aug. 1897. He was educated at Yale, assisted Rev. James H. Linsley in compiling catalogues of the mammalia, reptiles, fishes and shells of Connecticut in 1842–43, was assistant secretary of the State of Connecticut in 1847–52 and again in 1858–61, and secretary during the Civil War, 1861–65. He was corresponding secretary of the Connecticut Historical Society in 1849–63, and its president in 1863–89. In 1863–91 he was librarian of the Watkinson Library of Reference at Hartford, was an original member of the American Philological Society from its organization in 1869 and was its president in 1874–75. He was elected to the National Academy of Sciences in 1872 and was appointed lecturer on the Indian languages of North America at Yale in 1873. He prepared the catalogue of Americana belonging to George Brinley which added much to his reputation as a bibliographer, and devoted the closing years of his life to the compilation of a dictionary and vocabulary from John Eliot's Indian Bible, which he was reputed to be the only living American able to read. His manuscript was published under the title 'Natick Dictionary' (1903). His other works include 'Colonial Records of Connecticut' (3 vols., 1850–59); 'The Best Method of Studying the Indian Languages' (1871); 'Historical Notes on the Constitution of Connecticut' (1872); 'Indian Names of Places in

and on the Borders of Connecticut with Interpretations' (1881); 'Memorial History of Hartford County' (2 vols., 1886), etc.

TRUMBULL, John, American jurist and poet: b. Westbury (now Waterbury), Conn., 24 April 1750; d. Detroit, Mich., 10 May 1831. Graduated at Yale in 1767, he began in 1770 to contribute to the *Connecticut Journal* and *New Haven Post-Boy* a series of essays called 'The Correspondent,' patterned after 'The Spectator,' in which he satirized the controversial writers of the time and the American slave-traffic; and published in that year 'An Essay on the Use and Advantages of the Fine Arts.' In 1771 he became a tutor in Yale and began the study of law, which he continued in John Adams' Boston office in 1773, in which year he was admitted to the bar. He practised at New Haven in 1774–76, at Westbury in 1776–81 and from that time at Hartford. In 1789–95 he was State's attorney for Hartford County, in 1792 and 1800 was elected to the legislature, in 1801–07 was judge of the Connecticut Superior Court, and in 1808–19 of the Court of Errors. From 1825 he resided at Detroit. His 'Progress of Dulness' (Part I, 1772; Part II, 1773) was his first elaborate work in verse. It was a clever satire on the defective culture of contemporary American society, and its epigrammatic ridicule made a great stir. But he is known for 'McFingal' (1782), a burlesque epic, in the metre and much in the style of 'Hudibras,' which it follows, however, without sacrifice of originality. It admirably developed the humorous characteristics of that disturbed time, and from the first had an unprecedented popularity. Its hero is Squire McFingal, a Scottish-American Tory politician of Massachusetts, with a gift for tedious and inflated speechifying; his Whig opponent, Honorius, seems to be, according to Tyler, a portrait of John Adams. It was the most representative of the distinctly literary productions of the Revolution, to whose movement it greatly contributed. No contemporaneous record presents so well the thought of the period. In pointedness, in ingenuity of rhyme, in the skilful arrangement of its ludicrous narrative, it is admirable. Many extracts such as:

> "No man e'er felt the halter draw,
> With good opinion of the law,"

passed into the general anthology of quotations. It was reprinted by Lossing, with introduction and notes, in 1857, and another edition of it appeared in 1881. In all, about 40 editions have been circulated in the United States and England. For its full understanding the work now requires some study of the Revolutionary epoch. Trumbull's 'Poetical Works' were collected in 1820. Consult the excellent account in Tyler, 'Literary History of the American Revolution' (1897).

TRUMBULL, John, American artist: b. Lebanon, Conn., 6 June 1756; d. New York, 10 Nov. 1843. He was graduated at Harvard in 1773; studied painting in Boston; served in the Revolutionary War; and in 1780 went to England to study under West, but was imprisoned on a charge of treason and forced to leave the country. Subsequently he returned to England and became the pupil of West. In 1786 he produced his first historical picture, the 'Battle of Bunker Hill'; which was soon followed by the 'Death of Montgomery Before Quebec' and 'Sortie of the Garrison from Gibraltar.' In 1817 he was employed by Congress to paint four pictures for the rotunda of the Capitol at Washington, namely 'The Declaration of Independence,' the 'Surrender of Burgoyne,' the 'Surrender of Cornwallis,' and the 'Resignation of Washington at Annapolis.' He was for many years engaged in finishing his sketches, many of which, together with portraits and copies of old masters, 54 pictures in all, he surrendered to Yale College in consideration of an annuity of $1,000. Consult his 'Autobiography' (1841).

TRUMBULL, Jonathan, American patriot: b. Lebanon, Conn., 12 Oct. 1710; d. there, 17 Aug. 1785. Graduated from Harvard in 1727, he studied theology and was licensed, but in 1731 left the ministry for the law, was a member of the assembly in 1733, its speaker in 1739, and deputy-governor in 1767–68. From 1769 until his resignation in 1783 he was governor. During the Revolution he worked with vigor for independence. He is said to have been the original "Brother Jonathan" (q.v.), that being Washington's familiar name for him. He was the only colonial governor to take the popular side in the struggle; and when notified by Washington (August 1776) of the inadequacy of the army, called for nine more regiments of 350 each, in addition to the five Connecticut regiments already supplied. These troops arrived at New York just in time to meet the British advance. In 1766–69 Trumbull was also chief justice of the Superior Court of Connecticut, and as such he has been highly praised by Bancroft. Consult the 'Life' by Stuart (1857).

TRUMBULL, Jonathan, American politician, son of the preceding: b. Lebanon, Conn., 26 March 1740; d. there, 7 Aug. 1809. He was graduated from Harvard in 1759, and prior to the Revolution was a member of the Connecticut legislature and speaker of the house. He was paymaster-general in the Connecticut army, 1775–80, and military secretary to Washington, 1780–83. He sat in Congress, 1789–95, being speaker of the House of Representatives, 1791–95, was United States senator, 1795–96, lieutenant-governor of Connecticut, 1796–98, and governor from 1798 till his death.

TRUMBULL, Joseph, American statesman: b. Lebanon, Conn., 7 Dec. 1782; d. Hartford, Conn., 4 Aug. 1861. He was graduated at Yale in 1801, was admitted to the bar at Windham in 1803 and settled in Hartford where he practised until 1828. He represented Hartford in the legislature in 1832–48 and in 1851, was representative in Congress in 1839–43 and in 1849–50 was governor of Connecticut.

TRUMBULL, Lyman, American politician: b. Colchester, Conn., 12 Oct. 1813; d. Chicago, Ill., 25 June 1896. He studied law in Georgia, was admitted to the bar and settled in Belleville, Ill., in 1837. He was secretary of state of Illinois in 1841–42; and justice of the Supreme Court of the State in 1848–53. He was United States senator, 1855–73, and although formerly a Democrat, became prominent as a Republican. He secured the passage of the 14th Amendment; and was one of the Republicans who voted

against the impeachment of Andrew Johnson. After 1872 he supported the Democratic party.

TRUMPET, a musical wind-instrument with a flaring mouth, generally made of brass, and sometimes of silver. Primitive trumpets were straight tubes. The curves were introduced to shorten the length. Slides, valves and keys are now added. (See HORN). The orchestral or slide trumpet consists of a tube about five and one-half feet long, twice curved, and ending in an open cone. The slide is on the second curve. The scale of the slide trumpet begins with A sharp in the first space of the brass stave, and extends to C above the treble stave, but C below the bass stave can be produced. The natural notes are C (below bass), C (octave), G, middle C, E, G, B flat, C, D, E, F, G, A, B flat, B, C. A univalve trumpet was introduced by Bassett in 1876. The addition of the valve greatly improves the slide trumpet in accuracy and completeness without injuring its characteristic tone. The trumpet, with its thrilling notes and bugle calls, is well fitted for military music.

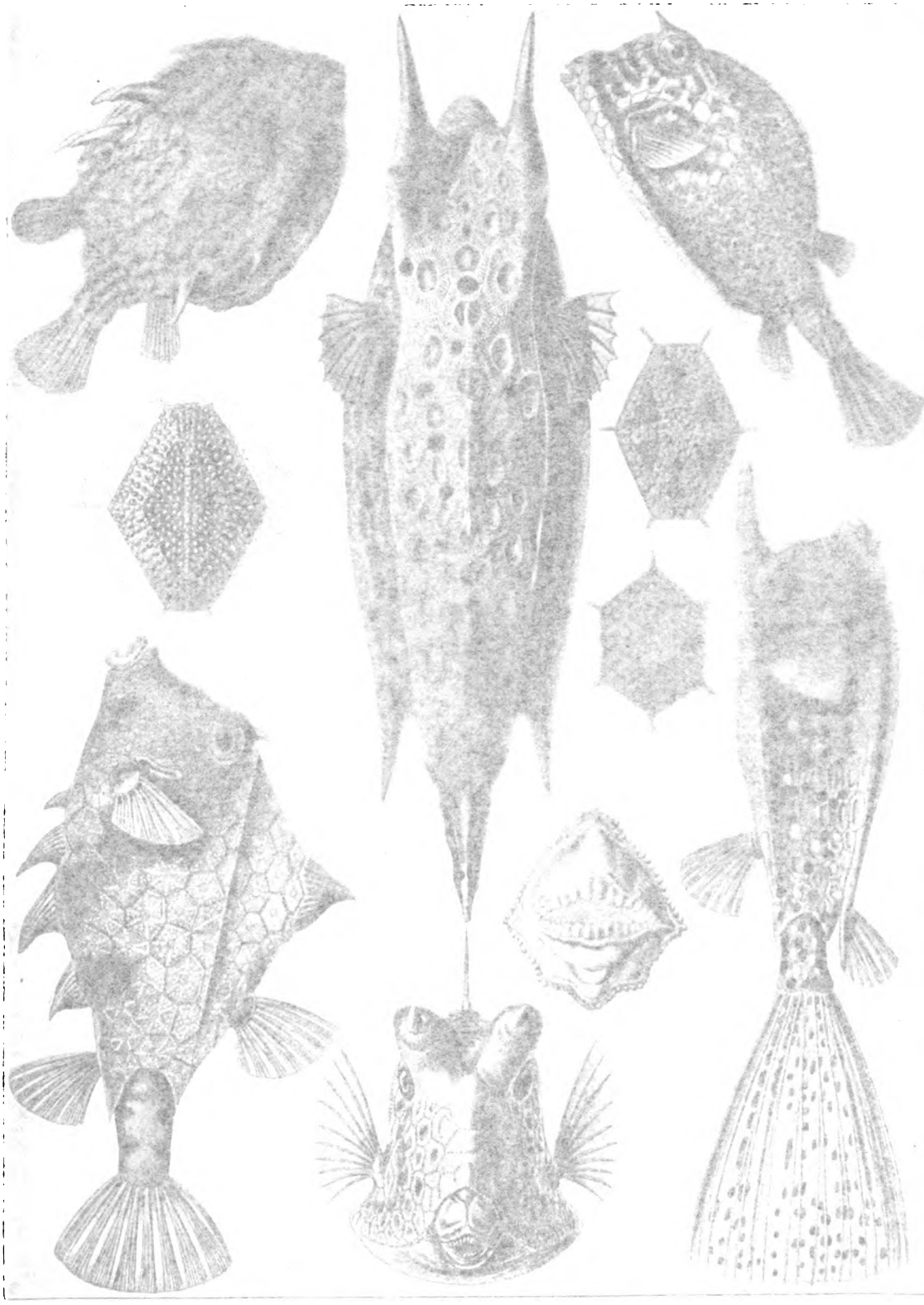
TRUMPET-FISH, or **TRUMPETER,** one of the most important food-fishes (*Latris hecateia*) of the southern hemisphere. It ranges from 30 to 60 pounds in weight and is considered the best flavored of any of the fishes of New Zealand, Tasmania and South Australia. Large numbers are smoked and sent into the interior.

The name is also applied to several species of fishes belonging to the small families *Aulostomidæ, Fistulariidæ* and *Macrorhamphosidæ,* all belonging to the order *Hemibranchii,* and all having the facial bones much elongated to form a tube bearing the small nearly or quite toothless mouth at the end. They are fishes of peculiar aspect, the body as well as the head being elongated and sometimes protected by bony plates, and in the *Fistulariidæ* the caudal fin bears a pair of long, slender filaments. These fishes are variously known also as tobacco-pipe fishes, cornet-fishes, snipe-fishes and bellows-fishes, all these names having reference to the tubular snout. They are tropical, and species of each family occur in the Gulf of Mexico and the southern waters of the United States.

TRUMPET-FLOWERS, plants belonging to *Tecoma* and *Bignonia* and allied genera of the family *Bignoniaceæ,* having trusses of gaily-colored flowers with funnel-form corollas. *Campsis grandiflora* is the showy trumpet-flower or trumpet-creeper from China, with drooping, salmon-yellow and scarlet flowers three inches broad, but is not so hardy as the American *C. radicans,* which is a very common shrub of the South, and is called Virginia trumpet-flower by foreigners. It climbs high by rootlets, sending out long, pendulous sprays with opposite pinnate leaves which end in a corymb of tubular flowers, orange colored as to the tubes, and expanding into a five-lobed scarlet limb. Both of these species are planted extensively, as ornamental vines, to cover walls, verandas, etc. The yellow elder, or upright trumpet-flower (*Tecoma stans*), is an evergreen shrub of erect growth introduced from Central America, and growing readily in southern Florida. The leaves are pinnate, and immense panicles of golden-yellow flowers bend down the branches with the weight of their bloom. The Cape honey-suckle (*Tecomaria capensis*) is an evergreen climber which can be trained into shrub form, and is useful for Florida; it can also be grown as a climber, or as a pot-plant, in northern greenhouses. *Bignonia venusta* of Brazil is another greenhouse climber in the North, but can be grown out of doors in warm climates. Its hanging, string-like shoots are clothed with axillary and terminal clusters of large tubular orange-yellow flowers, for four or five feet of their length. The cross-vine, or quarter-vine (*B. crucigera*) of the southern United States, so called because a transverse section of the stem shows a cruciform marking, is also known as the tendriled trumpet-flower. The leaves are pinnate with only two leaflets, and terminate in a branched tendril; the flowers are large and campanulate with undulate or slightly lobed limb borne in few-flowered cymes. *Gelsemium sempervirens,* formerly classified among bignonias, is not only called yellow jasmine, but also the evergreen trumpet-flower. Various species of *Solandra, Brunfelsia, Catalpa,* and *Datura,* are known as trumpet-flowers; especially tropical tree-species of *Datura,* such as in Java form boundary hedges about the coffee plantations, and are a marked feature in the landscape. *Thevetia neriifolia,* of tropical America, is an oleander-like, poisonous plant, with yellow, fragrant flowers, and curious fruit, and is known as yellow-oleander, or trumpet-flower; it grows luxuriantly in Florida.

TRUMPET SHELL, a large marine gasteropod (*Triton variegatus*) of the South Seas. The shell, which is a foot or more in length, is white mottled in irregular spiral rows with ruddy brown and yellow, deepening into chestnut at the point; interior white; lip with smooth white ridge on a black ground. It is employed by the Australian natives and the South Sea Islanders as a trumpet. To fit the shell for this purpose a round hole is bored at the side, about one-fourth the length from the tip, and a loud hoarse sound is produced by blowing across the hole, as a performer plays a flute. While blowing, the right hand is placed in the cavity of the shell. The large conch shells of the West Indies are frequently pierced and used for the same purpose.

TRUMPETER, a genus (*Psophia*) of wading-birds, related to the cranes, found in South America, and so named from their hollow cry, which results from the peculiar conformation of the windpipe or trachea. The bill is short and stout, and except for their long legs and necks these birds resemble fowls. The most familiar species is the golden-breasted trumpeter (*P. crepitans*), which is readily tamed and becomes a favorite inmate of the house. The head and neck are velvety-black; the breast is glossy-green; the back gray; and the wings, tail and under parts black. This species, like the others, lives in the forests in flocks; and feeds upon fruit, seeds and insects. They run swiftly but seldom fly. The eggs, numbering 10 or 12, are light-green in color, and are deposited in a mere hole scratched in the ground. Only about five other species are known, all belonging to the single genus and constituting the family *Psophidæ.* A large North American swan (*Olor buccinator*) has also borne the name. See TRUMPET-FISH.



TRUNK FISH

[illegible]

TRU[illegible]

[illegible] the weight of [illegible]

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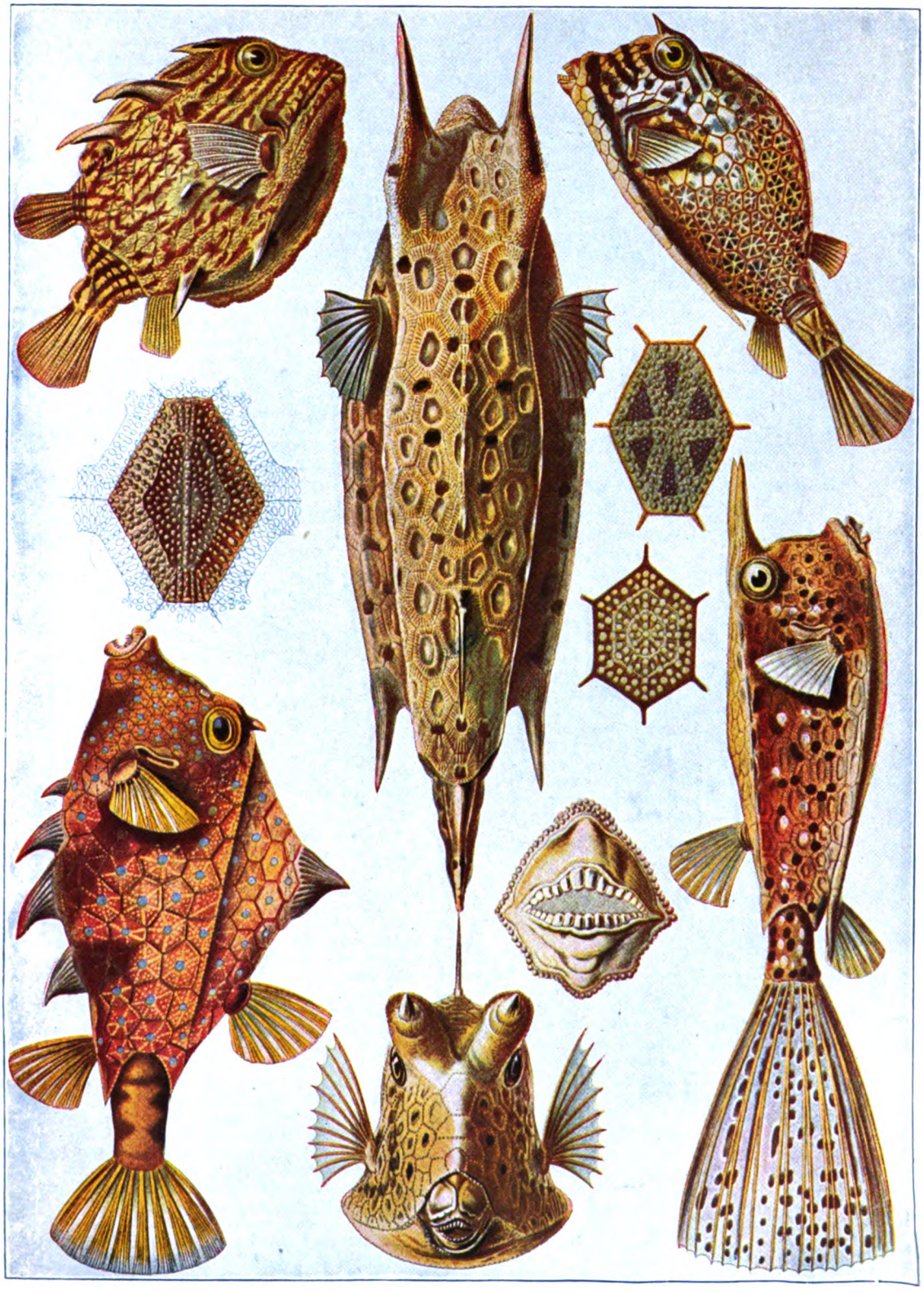
TRUMPETER, a [illegible] *Psophia* [illegible] See TRUMPET-FISH.



TRUNK FISH

TRUMPETER OF SÄKKINGEN, The. The Trumpeter of Säkkingen (Der Trompeter von Säkkingen, 1853) by Joseph Viktor von Scheffel, the most widely read of modern German stories in verse, blends the 17th century tradition of the checkered but finally happy love of a musician of Säkkingen and a baron's daughter with experiences of Scheffel's varied life. The narrative, humorous, thoughtful and quizzically satirical, interspersed with songs, grave and gay, tells first how Werner, student musician, under the protection of the Pastor (Scheffel's friend Riesterer of Rickenbach) becomes music teacher to the squire's daughter Margareta. Their loves are rudely sundered by the paternal aristocrat. Werner, going to Rome, becomes band-master to Pope Innocent XI. At a pontifical function 1 July 1679, Margareta recognizes Werner and swoons. The Pope, learning their story, ennobles Werner, unites the lovers and procures the squire's blessing. Sardonic comments and lyrics by the Pastor's cat, Hiddegeigei, on the course of true love are possibly a bitter-sweet echo of Scheffel's own disappointment in his love affair with his cousin Emma Heim. The Silent Man reflects the author's political disillusions of 1848. There are over 300 German editions of the 'Trumpeter.' It has been best rendered in English by T. Martin (1893).

BENJAMIN W. WELLS.

TRUMPETS, Feast of, a Jewish feast on the first and second days of the seventh month (Tisri), which was to be kept as "a sabbath, a memorial of blowing of trumpets, an holy convocation." No servile work was to be done on it; but an offering of fire was to be presented to Jehovah (Lev. xxiii, 23–25). It preceded by 10 days the Great Day of Atonement (27). In Numbers (xxix, 1–6), details are added as to the "offering of fire," which was to include the burnt offering, a meat offering, and a sin offering. The first of Tisri was New Year's Day of the civil year. It is still observed as a Jewish festival.

TRUNK, a light strong oblong box, now usually made of wood, cloth, leather or fibre, with metal corners, fastenings, locks, etc., used by travelers as a receptacle for clothing and other personal belongings. In the 18th century few trunks were needed as there was little traveling. The business of manufacture was then generally conducted by those who were saddlery and harness makers. It has long been a staple business, and of recent years shows a tendency to specialize. The most popular modern trunk is the wardrobe trunk, made to stand on one end, with supports for hanging gowns, coats, trousers, etc., and also a set of drawers with dressing case conveniences. Another specialty is the auto-trunk made in a variety of shapes to fit odd spaces in automobiles. In New York in 1840 there were 11 makers, and in 1901 there were five large factories whose sales amounted to $2,000,000. In the United States in 1905 there were 373 establishments engaged in the manufacture of trunks and valises, paying out $4,139,034 in wages. In 1914 there were 561 manufacturers in the country, employing over 10,000 people, using a capital of $18,571,000 and producing goods to the total value of $26,477,000, of which $12,847,000 represented actual production, the balance being cost of materials. Trunks and valises to a value of about $1,000,000 were manufactured in addition by other industries. This showing, however, represented a falling off of about 10 per cent as compared with 1909. New York State manufactures over one-fourth of all the trunks made in the United States and Pennsylvania, Illinois and Virginia come next.

TRUNK-BACK. See LEATHER-TURTLE.

TRUNK-FISH. A variety of fish of the order *Plectognathi* and the sub-order *Ostracodermi.* See COFFER-FISH.

TRUNK-HOSE, a kind of short wide breeches gathered in above the knees, or immediately under them, and distinguished according to their peculiar cut as French, Gallic or Venetian. This garment prevailed during the time of Henry VIII, Elizabeth and James I.

TRURO, troo'rō, **Thomas Wilde,** BARON, English statesman: b. London, 7 July 1782; d. there, 11 Nov. 1855. He was educated at Saint Paul's School, studied law, and in 1817 was called to the bar. He was retained for the defense of Queen Caroline in 1820 and made himself famous by his conduct of the case. He entered Parliament in 1831, sitting for Newark-on-Trent, and continued to hold that seat until 1841, with the exception of the years 1832–35. He subsequently represented Worcester until 1850 when he took his place in the House of Lords. He was appointed Solicitor-General in 1839, and Attorney-General in 1841, though he occupied the latter office but a few months. He introduced Rowland Hill's postal reform plan to the House in 1843, and in 1846 was reappointed Attorney-General by Lord Russell, an office which he vacated a few days later to become chief justice of the Court of Common Pleas. He was sworn as lord-chancellor in 1850 and at the same time was created Baron Truro. His career as chancellor was eminently successful, a fitting conclusion to his long and honorable career.

TRUSDELL, Charles Gregory, American philanthropist: b. Montgomery, N. Y., 1 May 1826; d. Chicago, Ill., 16 Feb. 1903. He received an academic education, studied theology, and in 1857 was ordained in the Methodist ministry. He held various charges in Iowa until 1865, in which year he became presiding elder of the Iowa City district. He subsequently accepted the pastorate of a church in Chicago and preached there until the fire of 1871 when he was appointed to superintend the distribution of the relief fund. In this capacity he expended nearly $5,000,000 for the relief of the fire sufferers. The Relief and Aid Society was continued afterward for the benefit of the Chicago poor and Trusdell remained superintendent until his death. He was appointed presiding elder of Chicago in 1885.

TRUSS, *in surgery,* an appliance for the support of a rupture or hernia (q.v.), or for keeping the injured parts in place when reduced. It consists of a pad of wood, hard rubber or other hard material, or of soft rubber filled with water — a water-pad — for compressing the aperture through which the hernia protrudes. In an inguinal hernia this pad is held in place

by a steel-spring band, or some metallic band molded to fit the inequalities of the body, passing wholly or partly about the hips, and assisted by a leather strap. Usually one of two pads are attached to the band posteriorly where pressure is exerted on one or both sides of the spine. A fair temporary truss may be made of a compress of cloth, cotton, oakum, etc., held in place by adhesive plaster and a spica bandage. An umbilical hernia may be kept in place by a pad, strips of adhesive plaster, and a cloth bandage. An ill-fitting, uncomfortable truss does harm.

TRUSS, *in architecture,* a combination of braced timbers, or of steel-work, or of both together, so arranged as to constitute a frame, that resists strains in two or more directions. A trussed beam is one braced against deflection. (For illustrations of trusses, see BRIDGE). The simplest example of a truss is the principal or main couple of a roof, in which the tie-beam is suspended in the middle by the king-post to the apex of the angle formed by the meeting of the rafters.

TRUSS BRIDGES. See BRIDGE CONSTRUCTION, MODERN METHODS OF.

TRUST COMPANIES. See BANKS AND BANKING — TRUST COMPANY.

TRUSTEE, *in law,* a person to whom property is legally committed in trust, to be applied either for the benefit of specified individuals or for public uses. The person for whom or in whose favor the trustee holds the estate, or any interest therein, is called the *cestui que trust.* Trusts are generally raised by marriage settlements or by wills. The ordinary trusts in the former case, as to real estate, are, in the first place, for securing to the wife payment of her pin-money during marriage, and of her jointure on her becoming a widow; then for raising the stipulated provisions for younger children, and also for providing for their maintenance while minors. Trusts are commonly raised in wills for the maintenance or advancement and portioning of children. Trustees may be declared verbally as regards personal estate, but as to land, writing is necessary. No one is compelled to undertake a trust, but if he once accept he cannot renounce it unless the trust-deed contains a provision enabling him to do so, or by the consent of all those beneficially interested in the estate. Trustees are bound to act in strict accordance with the terms of the trust, and are liable for the consequences of any breach of trust. However, courts may relieve a trustee from personal liability, either wholly or partly, if he has acted honestly and reasonably. They are accountable for the interest which they do or might make from the employment of the money in their possession, as also for the whole profits they may derive from trading with the trust fund. As their office is considered purely honorary, they are not entitled to any allowance for their trouble in connection with the trust. Trustees are liable for any misapplication of the trust fund arising either from ignorance of facts which they might by common diligence have known, or from ignorance of the law in any case, even though they may have acted in good faith and in reliance on the opinion of eminent legal advisers; but they may apply for advice by petition to a judge or by summons to a judge, and so be absolved from responsibility. The estates of trustees deceased are liable in the case of fraudulent administration. The appropriation of the trust fund by the trustee to his own use makes him liable to prosecution and punishment by imprisonment. There is a growing tendency to leave such trusteeships to trust companies.

TRUSTS. I. An economic unit is an aggregate of land, labor and capital united together by more or less permanent bonds and operating under the guidance of some directing mind or minds. Economic units differ in size, in the character of the work done and in the relative amount of the co-operating elements employed, but all are alike in one respect, viz., all are destroying natural resources and using up human energy in order to produce commodities and services necessary for human existence or human pleasure. Under the capitalistic system, each economic unit is controlled and directed by certain persons called proprietors, who, generally speaking, own the land, hire the labor and reap the benefits that arise from producing the commodities or services at less than the costs incurred. Under such circumstances, the proprietors naturally try to form economic units of such size and such character as to secure a minimum of costs for a given benefit or a maximum of benefits for a given cost or costs. In this connection, three facts should be borne in mind; first, it is always much easier to form and to operate small economic units than large ones; second, in certain kinds of work, larger units are necessary, in many kinds, the larger units are more productive and therefore more profitable for their proprietors; third, economic units may be united into compound economic units, or systems, of such size and character that all or nearly all the advantages which might have been obtained by the creation of large size units at the outset are gained by the process of uniting or amalgamating existing economic units at any time after their formation. In view of the above conditions it is not only natural but in most cases extremely desirable that proprietors should start out in a modest way, compare costs and results in the small and large units operating in the same particular field and attempt to adjust the size of the operating units according as the small or large are found to be more productive.

An increase in the size of the units and in the scale of the operations may be secured either by adding more land, labor and capital to existing units or by uniting existing units into systems as above stated. The former process secures the requisite size by growth, the latter by union. Generally speaking, wherever conditions have changed in such a way that the larger units possess advantages over the smaller ones, both processes are going on side by side, some proprietors employing one, others the other, the choice being determined partly by the mental and moral characteristics of the proprietors, partly by the peculiar conditions of the industry in which the transition from small scale to larger scale production is economically demanded. Whatever the conditions in the industry and whatever the character of the proprietor, the process of securing the *readjustment* of size by growth is accompanied by con-

sequences of which the proprietors as a class are cognizant. To convert all of the small economic units into large units is of course impossible except in a very rapidly growing field. Some of the economic units must therefore remain small, and smallness under such circumstances means economic death. To avoid such disastrous consequences the proprietors may prefer to join together into unions, thus securing certain of the advantages of size without at the same time facing a competitive struggle that must inevitably result in the complete annihilation of those units that for any reason are left behind. The unions thus formed may be composed of any number of economic units from two to the total number in existence. Unions composed of a relatively small number of economic units are co-operative agencies for performing in common certain functions that otherwise would have been performed by each member separately. They, therefore, are institutions possessing distinct economic advantages to society by reason of their efficiency and also by reason of the competition which they foster and preserve. Unions composed of a large number of economic units, while possessing the advantages that grow out of co-operative action, may gain by virtue of the union a very different kind of power, viz., the power of monopolistic control over the goods and services which they respectively produce. In the latter case the organizations thus created are enabled not only to retain for the proprietors all the benefits arising from the co-operative action which follows, but further to gain an additional advantage in the enhanced price which they are in a position to obtain for their goods and services.

II. The simplest form of union is one in which the proprietors secure concerted action along some one or more lines by a simple agreement, providing for uniform action upon certain stipulated points or for the sharing of privileges or benefits that flow either directly or indirectly from the union.[1] Agreements providing for uniform action upon one or more specified points are called simple combinations; those providing for a sharing of benefits are called pooling combinations, or in the vernacular of the trade, pools. Combinations may be compared to a league of nations in that each member retains its independence in full except as it temporarily surrenders a portion of its sovereignty in the interests of the common good for a limited period of time and even then subject to withdrawal on notice or without notice at the risk of suffering certain specified or contingent penalties. Simple combinations embrace the following types of agreements: first, those limiting the territory within which the several parties may do business; second, those limiting the amount of business which may be done; third, those fixing the price at which each may sell its goods or services. Pooling combinations include: first, agreements providing for a distribution of the business in certain agreed upon proportions, and second, those providing for a sharing of the profits arising from the business over which the pool has jurisdiction. Combinations and pools may also be classified into various categories on the basis of the number of specific agreements included within the union, as for example, simplex, duplex, triplex, quadruplex, etc.[2] A simplex combination is based upon an agreement as to one point only, as price, or output. A duplex combination is based upon an agreement that covers two important features, as price and output, or price and percentage of business. As the number of points which the agreement covers increases, the field within which the members are free to act upon their own motion correspondingly diminishes and if in any case all possible points are included, the combination during the period of the agreement would be to all intents and purposes a single economic unit occupying the field formerly covered by its constituent members.

III. The higher types of union differ from the simpler types in two respects: first, all of the proprietors' interests in the several economic units are amalgamated or merged into one completely or nearly completely unified organization; and, second, they generally are permanent institutions. Such institutions may be separated into two main classes, first, federated unions and second, centralized unions. The federated unions embrace two classes, trusts and holding combinations. The centralized unions include one class only, viz., the single corporation owning directly the various plants and properties which formerly were separate economic entities. The trust, the holding corporation and the single corporation composed of an aggregate of formerly independent economic units are financial unions in contradistinction with the combinations which are merely incomplete operating unions.

IV. A combination is formed by agreement of the parties and like any contract may be either verbal or written. A financial union on the other hand involves a purchase and a sale either of securities or physical assets and consequently the formation of such an organization includes first, an agreement as to the terms of the exchange and second, provision for the transference of the several proprietors' interests to a newly created body legally authorized to purchase and hold the same. Let it be supposed that *A*, *B* and *C* are proprietors of business enterprises manufacturing and selling safety razors. After selling their different products in competition for some years, *A* conceives the idea that an agreement as to prices at which each may sell his goods would, by preventing price competition, enable each of the razor makers to increase his own earnings. *A* therefore suggests a meeting and after a discussion, supplemented in many cases by an investigation of costs and the actual prices obtained for their respective goods, an agreement is reached and a memorandum covering the points agreed upon is drawn up and signed or a verbal contract is entered into according as the combination is a written or verbal one. After the combination is formed, the parties

[1] These agreements may provide means and measures for their own enforcement, may inflict penalties for infraction of their terms, or may leave the observance of their various stipulations to the good faith of the several members. In the latter case the combinations thus formed and operated are termed gentlemen's agreements.

[2] Stevens, 'A Classification of Pools and Combinations based upon American Experience' (*American Economic Review*, Vol. III, No. 3, pp. 545-575).

separate and proceed to manage their separate business enterprises as before except that each of the proprietors causes a new price list to be prepared and issues instruction to his sales managers to sell goods only at the prices thus established. Whenever any one of the parties to the combination desires to change the price list, a meeting of the principals or their agents becomes necessary at which the whole question of price is taken up and a decision reached either to abide by the old price list, to establish a new one or failing an agreement on one of the above points to terminate the agreement and resume the former power of price making by individual action. The combination is then by virtue of its structure both incomplete in its scope of action and unstable in point of time. It, therefore, may be used only when the above features are relatively unimportant. To secure either permanency or completeness or both some form of financial union, that is either a trust, a holding corporation or a single corporation must be selected and adopted.

To create a trust any number of business units as for example, a, b, c, d, etc., transform their individual business establishments into corporations,[1] formed upon similar plans. They then organize each of the new corporations and thereafter call a meeting of the representatives of the several business units that desire to enter the trust for the purpose of formulating a plan of union. To do this a trust deed[2] is drawn up, a document similar to a corporate charter in its essential features, but peculiar in that it provides (1) that the common stock of the several corporations included in the plan be exchanged for trust certificates and (2) that the trustees (a) manage the several corporations "in the manner they deem most conducive to the best interests of the holders of said trust certificates"[3] and (b) receive all interest and dividends declared upon and paid upon the bonds and stocks which they hold in trust and distribute such receipts including also any receipts from the sale of the trust property by declaring and paying dividends upon the outstanding trust certificates. A trust, then, is a group of corporations tied together into a permanent financial union in accordance with the terms of a trust deed and operating under the control of a board of trustees created and acting under the authority of the said instrument. To make the above definition conform to the conditions which were present in all of the trusts established during the decade 1879–88, two others must be added, viz. (1) that the corporations thus joined together must be competing with each other at the time of the union and (2) that practically all of the producing units in the same market must be included in the organization.

The first of the industrial trusts was formed in 1879 by the Standard Oil interests under the guiding genius of Mr. S. C. T. Dodd, later vice-president and general counsel of that unusual aggregation of properties and brains. The trust, a unique form of federated union, was invented in order to secure centralized administration without at the same time obliterating the corporate identity of the several units of which the organization was composed. The success of the Standard Oil Trust was so pronounced that it was very soon copied and within the decade immediately following, a half dozen other trusts were formed[4] and began operation. The career of the trust as an individual organization was, however, short-lived, two of the leading examples, the Sugar Trust in New York[5] and the Standard Oil Trust in Ohio,[6] being declared illegal organizations on two grounds, first, because it was beyond the power of corporations, either directly or indirectly, to enter into partnerships with other corporations and second, because it was illegal to form monopolies. As a result of the two decisions above referred to it became evident that either the federated form of financial union must be abandoned or some substitute invented or discovered. Fortunately for the trust institutions, the path was open. As early as 1833,[7] the Baltimore and Ohio Railroad Company was authorized by the State of Maryland to purchase the unsold portion of the stock of the Washington Branch Road, provided a majority of the stockholders should vote in favor of the said purchase. In due time their consent was obtained and for over 66 years the stock in the Washington Branch Road was carried as an asset in the balance sheet of the parent company. Beginning about 1850 the practice became common among the railways[8] and later was adopted by the Western Union Telegraph Company and various other industrial corporations. The stockholding method of uniting corporations was thus well known among financiers when the trust was declared illegal and would have been immediately adopted by the various trusts except for the fact that at that time express authority must generally be obtained from some legislature[9] and naturally legislatures were not inclined to grant the requisite authority where monopolies might thus be created or maintained. At this juncture the State of New Jersey amended her general corporate law by adding a clause providing that corporations incorporated under her laws might, with certain exceptions, hold stock in other corporations whenever such power was deemed desirable by the board of directors and the right to do so was expressly stated in the articles of a corporation.[10] Soon thereafter the American Sugar Company, which after the dissolution of the trust had purchased the assets of the various subsidiary corporations, purchased the stock of several Philadelphia refineries and in a leading case the purchase was held to be legal under the Sherman Anti-Trust Act.[11] The holding corporation thus having been authorized by one

[1] Unless the existing business units are already corporations, in which case the existing organizations are used.

[2] For a copy of the Standard Oil Trust deed of 2 Jan. 1882, consult Report of the Commissioner of Corporations on the Petroleum Industry, Part I, pp. 361–369.

[3] From the Standard Oil Trust Deed, paragraph 15.

[4] The Cotton Oil Trust, the Sugar Trust, the Whiskey Trust and some others of lesser importance.

[5] The People vs. North River Sugar Refining Company, 121 N. Y. 582.

[6] Standard Oil Trust Case, Ohio, p. 450.

[7] Report of the Baltimore and Ohio Railroad Company, 1833, pp. 7–10.

[8] Robinson, 'The Holding Corporation' (*Yale Review*, February and May 1910).

[9] Noyes, 'Intercorporate Relations,' p. 264.

[10] Laws of New Jersey, 1889, p. 414.

[11] United States vs. E. C. Knight Company, 156 U. S., p. 1 et seq.

of the States and one such organization approved by the highest court, this form of federated union was generally adopted by all the greater aggregations of capital from 1894 on for the next decade. During the period 1894–1904, the new form of federated union was so extensively used by the railways and the industrial corporations that the holding corporation threatened to serve as the tool of well-nigh universal monopoly and on this account the economic literature of the period was largely devoted to a discussion of the growth, development and dangers of the new type of trust.

Curiously enough the turning point came in connection with the creation of a holding corporation uniting two of the greater railway systems. In 1900, Mr. James J. Hill, desiring to consolidate into a more permanent union the vast railway interests of which he was the head, projected a holding company to unite the various railways known as the Great Northern system, and in connection with this scheme the proposal was made to include the North Pacific in the new organization. After a memorable contest in which the Harriman interests played a spectacular part, the project was perfected, the Northern Securities Company was incorporated 12 Nov. 1901 and shortly thereafter the new corporation acquired by exchange of its stock a large majority of the stock of both the Northern Pacific and the Great Northern Railway companies. This union aroused marked antagonism in the Northwestern States and as a result, early in 1902, suits were brought by both the State of Minnesota and the United States for the purpose of securing the dissolution of the Northern Securities Company as an illegal trust under the Federal Anti-Trust Law, and after a notable legal contest, the Supreme Court held the new company an illegal combination and consequently enjoined it from voting the stock in the two companies and from exercising any control over the companies whose stock it held.[1] As a result of this decision, the Northern Securities Company as a holding corporation was dissolved and this type of union was thereafter considered to be of doubtful legality except in those cases when no monopoly was obtained by its means. The decision in the Northern Securities case was later sustained and extended to cover consolidations composed of manufacturing companies by those rendered in the Standard Oil[2] and Tobacco[3] cases in 1911.

Although the single corporation has been used at intervals throughout its history[4] as an agency for uniting independent business establishments into more or less completely consolidated financial unions, such use was of small importance before 1890 and even since then the federated union has been more widely patronized.[5] While the space available for this article is too limited to go into details, it may nevertheless be pointed out that in the beginning of its history the Standard Oil Company made extensive use of this device and it was only when this corporation began extending its scope so as to include pipe-lines and other allied interests whose identity it was desired to preserve that the trust and the holding corporation form became the favored instrument of consolidation. In the later history of the trust movement two cases may be mentioned. When in 1891 the Sugar Trust was dissolved as a result of the court decisions, a new corporation, the American Sugar Refining Company, was organized and it proceeded to purchase the properties which the trust had formerly controlled.[6] During the later period of consolidation the International Harvester Company has been the most important aggregation to make use of the single corporation as a means of uniting a group of allied business enterprises. This union was formed in 1902[7] and in 1912 the United States filed a petition[8] in the District Court, district of Minnesota, alleging that the single corporation thus formed was a monopoly and asking that the combination be decreed to be in restraint of trade and a monopoly under the Anti-Trust Act of 1890. Here then we have a case presented for adjudication[9] in which the union is neither in the form of a combination, a trust, a holding corporation, but in the form of a consolidation consummated by the purchase by a single corporation of the tangible properties of competing economic units.

The language of the Sherman Anti-Trust Act is seemingly as comprehensive as possible. "Every contract, combination in the form of trust or otherwise, or conspiracy, in restraint of trade or commerce among the several States or with foreign nations" is declared to be illegal. But the language of a statute must be interpreted by the courts before its meaning is certain and the Sherman act is not an exception. For the first two decades of its history it was strongly asserted by counsel for various combinations that the combining of competitive units by purchase[10] was not prohibited no matter what the effect upon competition, since otherwise Congress would have intended to place a limit upon the acquisition of property. It was early intimated by the Supreme Court that this contention would not be sustained wherever the effect of sustaining it would mean the nullification of the act. Thus as early as 1905

[1] 193 U. S., p. 360.
[2] 221 U. S., p. 1.
[3] 221 U. S., p. 106.
[4] Consult Scott's Joint Stock Companies to 1720, for early instances.
[5] "In the case of the newer combinations in the United States it has been found that practically all the important ones are put into the form of a single large corporation. In many cases the new corporation buys the individual plants which it seems desirable to combine and thus becomes a single owner of all the establishments.
In other cases, and this is perhaps especially true with reference to the largest combinations, the stock of the constituent members is all bought by the single unifying company, the constituent companies then retain their organization intact, being controlled simply by this central corporation, as a stockholder, which can elect directors and officers at will and thus guide the management absolutely." Report of Ind. Com., p. vii.
[6] This same method was used by the United States Rubber Company, the National Cordage Company and its successor, the Standard Rope and Twine Company, the National Wall Paper Company, and indeed by a considerable number of the great consolidations formed immediately after the trust was declared illegal.
[7] The International Harvester Company, Bureau of Corporations, 1913.
[8] The United States of America, petitioner, vs. International Harvester Company et al., Petition in Equity. In the District Court of the United States for the District of Minnesota.
[9] In the Supreme Court of the United States, International Harvester Company, appellant, vs. The United States of America. Brief for the United States, pp. 10–19.
[10] In the Supreme Court of the United States, 1914. International Harvester Company vs. United States of America. Brief for the United States, p. 48.

it was stated that the "possession of the power, which if exercised, would prevent competition, brought the case (the Northern Securities) within the statute, no matter what the nature of the title was."[1] The view here indicated in a general way was confirmed and made so specific that all reasonable doubt as to the attitude of the Supreme Court toward the meaning of the first clause of the act was removed by the language used in the Standard Oil case of 1911[2] and later in the Tobacco[3] and Union Pacific[4] cases. In the former case, in a passage which was devoted specifically to an examination of the first and second sections of the act with a view to determining their meaning, it was stated "that in view of the many new forms of contracts and combinations which were being evolved from existing economic conditions, it was deemed essential by an all-embracing enumeration to make sure that no form of contract or combination by which an undue restraint of interstate or foreign commerce was brought about could save such restraint from condemnation," and "undoubtedly, the words 'to monopolize' and 'monopolize' as used in the section reach every act bringing about the prohibited results." This judicial interpretation of the meaning of the first two sections of the act, growing out of the adoption of the "rule of reason," adopted in the Standard Oil decision of 1911, reaffirmed and made even more specific as to the purchase of either properties[5] or stocks,[6] has made the single corporation which has established a monopoly by the purchases of the various necessary properties, an illegal combination in restraint of trade and, therefore, subject to all the pains and penalties of the anti-trust law. The adoption of the rule of reason by the Supreme Court, it should be noted, has accomplished two desirable results. In the first place it has made the formation of monopolies illegal whatever the method or device adopted, and in the second place, by placing the emphasis upon results rather than on form, it has removed the ban upon the formation of financial unions of related enterprises when such union does not result in the establishment of consolidations of monopolistic power. Proprietors of small economic units are thus free to combine for the purpose of gaining the advantages of large scale operation provided they stop the process of combination before monopoly powers are gained. The proprietors thus gain the advantages of more economical production and at the same time the major portion of such advantages accrue to the consuming public by reason of the fairer and more normal competition which necessarily follows.

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[1] Harriman vs. Northern Securities Company, 197 U. S., p. 291.
[2] 221 U. S., pp. 1, 78, 79.
[3] 221 U. S., pp. 106, 176, 177.
[4] 226 U. S., p. 61.
[5] United States vs. American Tobacco Company, 221 U. S., p. 176.
[6] United States vs. Union Pacific Company, 226 U. S., pp. 61, 97.

TRUSTS, THE GROWTH AND CONTROL OF. Magnitude of the Trusts.— In 1904, 'Moody's Manual of Corporation Statistics,' 'The Truth about Trusts,' and other cognate works, stated that there were seven greater industrial trusts in the United States having an aggregate capitalization in stocks and bonds of a par value of $2,662,752,100, and controlling over 1,500 subsidiary plants, and 298 lesser industrial combinations with a total capitalization of $4,055,039,433, and controlling over 3,400 subsidiaries. Adding various reorganized trusts, the aggregate capitalization outstanding in the hands of the public of 318 important and active industrial trusts at that time was no less than $7,246,342,533, representing in all consolidations of nearly 5,300 distinct plants, covering practically every line of productive industry in the United States. Mr. Moody also gave details of over 1,500 distinct corporations, of which 251 had a capitalization of $6,905,700,000, and 410 had a total floating capital of $20,379,162,511. The United States Steel Corporation, the largest of all, with its numerous subsidiaries, represented $1,703,168,118 of this aggregate capitalization. Under date of 11 Sept. 1912, Albert H. Walker, author of 'History of the Sherman Law,' in 'President Taft and the Sherman Law,' noted that from the beginning of the Taft administration to that date, among 62 prosecutions begun under the Sherman law, the only cases that developed any hope of a general public benefit were those of the following companies: Standard Oil, American Tobacco, Du Pont Powder, Electric Lamp, Standard Sanitary, Wire Pool, Sugar Refining, Shoe Machinery, United States Steel, Cash Register and International Harvester. He also gave a list of 50 holding companies that had not been disturbed "in their regular business of violating the Sherman law throughout the administration of President Taft." These holding companies had a capitalization of over $2,300,000,000, and controlled more than 700 subsidiary corporations. Further, he declared: "I can furnish a list of more than 950 other industrial holding companies which have an aggregate capitalization of more than five thousand million dollars, with more than 6,000 subsidiary corporations."

Sherman Anti-Trust Law.— This act of Congress, originally proposed and outlined by John Sherman, when United States senator from Ohio, was perfected by the Judiciary Committee of the United States Senate, enacted by Congress, and approved by the President on 2 July 1900. That committee comprised Senators George F. Edmunds, chairman (Vermont), John J. Ingalls (Kansas), George F. Hoar (Massachusetts), James F. Wilson (Iowa), William M. Evarts (New York), James L. Pugh (Alabama), Richard Coke (Texas), George G. Vest (Missouri), and James Z. George (Mississippi). There has since been an animated controversy on the question of the authorship of the law, which has continued to bear Senator Sherman's name. The most prominent discussions were by Senator George F. Hoar, in his 'Autobiography,' Senator John B. Foraker, Albert H. Walker, Francis E. Leupp, in a contribution to *The Outlook*, and Senator Edmunds, in an analytical contribution, and George Harvey, in an historical 'Foreword,' both in *The North American Review* (December 1911). Senator Hoar, a year before his death, claimed the authorship of the law. Judge Edmunds declared that while the law bears the name of Senator Sherman that gentleman merely introduced a bill of which only the enacting clause, as first drawn, was retained by Congress, and that the law as it now stands was drafted by himself as chairman of the Committee. Further, he stated: "It would be correct to say that nearly every member of the Committee was the author of that bill, for my work in drawing it up was merely putting into logical shape what every member of the Committee had participated in." It may here be stated that the precise work of each member of the Committee has now been clearly established by the official records. Also that since the law has practically broken down in its operation, nobody is very particular as to who fathered it.

In framing the law the Judiciary Committee believed that the well-known principles guiding the courts in the application and construction of statutes would lead them to give the words of the act a beneficial and remedial rather than an injurious and technical interpretation, one hurtful to any honest trade, as well as out of harmony with the beneficent spirit and policy of the whole act. Nearly 11 years after the passage of the act (1911), Judge Edmunds wrote: "That belief has now, on the whole, been realized. It is believed that no case founded on the act has been finally decided by the courts adversely to the contracts or conduct of parties accused in which such contracts or conduct did not offend against both the letter and the spirit of the act, as well as against the sound public policy underlying both the provisions of the Constitution and the act of Congress touching the subject."

Chief Provisions of the Sherman Law.— The act is divided into eight sections, of which the first and seventh practically embody the spirit of the entire act.

Section 1 recites: "Every contract, combination in the form of trust or otherwise, or conspiracy in restraint of trade or commerce among the several States or with foreign nations is hereby declared to be illegal. Every person who shall make any such contract or engage in any such combination or conspiracy shall be deemed guilty of a misdemeanor, and, on conviction thereof, shall be punished by a fine not exceeding $5,000, or by imprisonment not exceeding one year, or by both said punishments, in the discretion of the court."

Section 7 recites: "Any person who shall be injured in his business or property by any other person or corporation by reason of anything forbidden or declared to be unlawful by this act may sue therefor in any Circuit Court of the United States in the district in which the defendant resides or is found, without respect to the amount in controversy, and shall recover threefold the damages by him sustained, and the costs of suit, including a reasonable attorney's fee."

In view of notable actions instituted by the Federal government it should be noted in connection with the foregoing that section 2 makes it a misdemeanor, punishable as in section 1,

for any person to monopolize or combine or conspire to monopolize any part of the trade or commerce among the several States or with foreign nations; and that section 8 classes corporations and associations with persons wherever the words "person" or "persons" occur in the act.

Notable Prosecutions Under the Sherman Law.—At the close of 1912 the United States government had instituted suits against about 125 corporations for violations of the Sherman law. In a special message to Congress on the trust question, 5 Dec. 1911, President Taft presented a list of 99 suits that had been brought up to 1 Nov. 1911. By administrations these were divided as follows: President Harrison (1889–93) seven; President Cleveland (1893–97) eight; President McKinley (1897–1901) three; President Roosevelt (1901–09) 44; President Taft (1909–11) 37; President Wilson (1913–16) 18. The most notable of these cases in which decisions were rendered favorable to the government were, briefly stated, as follows:

Northern Securities Company: suit brought to restrain the defendant from acquiring in any manner the control of the Great Northern and the Northern Pacific Railway companies, 10 March 1902; petition of the government upheld in Circuit Court, 9 April 1903; decision affirmed by United States Supreme Court, 14 March 1904.

Swift and Company, Chicago: suit brought to restrain alleged beef trust from suppressing competition and maintaining a monopoly in the purchase of livestock and the sale of dressed meats; Circuit Court granted a perpetual injunction, 26 May 1903; United States Supreme Court affirmed it, 30 Jan. 1905.

Armour and Company and others, Chicago: indictments found against various meat-packing companies and individuals, 1 July 1905; all objections decided in favor of the government except certain pleas of immunity based on information given the government; court sustained pleas so far as individual defendants were concerned, but overruled them with respect to the corporations.

Standard Oil Company of New Jersey: suit to dissolve illegal combination instituted 16 Nov. 1906; decree favoring the government filed 20 Nov. 1909; United States Supreme Court affirmed judgment, 15 May 1911.

American Tobacco Company: petition to dissolve illegal combination filed 10 July 1907; decision favoring the government except as to certain foreign corporations rendered 7 Nov. 1908; both sides appealed; United States Supreme Court sustained the government on all points and ordered dissolution, 29 May 1911.

Du Pont de Nemours Company (Powder Trust): petition for dissolution of combination filed 30 July 1907; court ordered dissolution, 21 June 1911.

American Sugar Refining Company: indictment found, 1 July 1909; United States Supreme Court decided defendant's plea of the statute of limitations in favor of the government.

Missouri Pacific and 24 other railway companies: petition to enjoin proposed advance in freight rates in Western Trunk line territory sustained by Interstate Commerce Commission.

Standard Sanitary Manufacturing Company: petition to enjoin the combination from restraining competition and enhancing prices of enamel ware, under cover of a patent licensing arrangement; government sustained, 13 Oct. 1911.

General Electric Company: bill in equity, charging combination in incandescent electric lamps and asking decree for dissolution, filed 3 March 1911; form of dissolution accepted by Circuit Court, 12 Oct. 1911.

United States Steel Corporation: petition for an injunction and dissolution filed 27 Oct. 1911. In June preceding, Herbert Smith Knox, United States Commissioner of Corporations, reported that when the steel corporation was organized in 1901 its tangible assets were worth $682,000,000; that by 31 Dec. 1910, these assets had increased to $1,187,000,000; and that by the latter date the corporation had an aggregate of $1,468,000,000 in outstanding securities. The corporation claimed that its iron ore properties were worth $700,000,000, but the Commissioner believed that $100,000,000 would be a liberal estimate. During the summer of 1911 the affairs of the corporation were put under investigation by a committee of the National House of Representatives, and in May 1912, the taking of testimony in the government's suit for an injunction and dissolution was begun in New York. But the steel trust, after an immense amount of testimony had been taken, secured a decision adverse to the government, from which the government appealed.

Application of the Rule of Reason.—The United States Supreme Court decided in favor of the government in the case of the Standard Oil Company of New Jersey and its subsidiaries on 15 May 1911, and in that of the American Tobacco Company on 29 May following. In each instance the decision was an elaborated review of the case, prepared by Chief Justice Edward D. White. It was held that the corporation was a monopoly in restraint of trade; that it must be dissolved within six months; that corporations whose contracts are not unreasonably restrictive of competition are not affected by the Sherman law. In the American Tobacco decision it was held that the company was a combination in restraint of trade and a monopoly in violation of law; that it had been guilty of intimidation and had shown a clear purpose to stifle competition; that the company must disintegrate and recreate a condition of transacting business not repugnant to the law, under the scrutiny of the Circuit Court; and that, if at the end of six to eight months the component corporations failed to bring themselves into harmony with the law, a receivership and dissolution would follow. This decision affected 65 American corporations, two English corporations, and 29 individual defendants; but none of them appear to have suffered seriously.

After a dozen or more years of litigation it became apparent that the government was not gaining anything for the people by its suits against the trusts. Up to 1918 more than a hundred civil suits and more than a hundred criminal suits had been brought against trusts and trust magnates, and four of these had been aimed at labor unions, doubtless with the quiet backing of some magnates who wanted to find if unions were not

also trusts. The government appeared to win a number of these suits. The great Standard Oil Company was ordered to dissolve, and divided itself into 60 odd companies, and went on as before. The National Cash Register Company was told to change its ways, and some of its officers received jail sentences, but the writer can find no record that any of them were served or that the Standard Oil ever paid that $29,000,000 fine which a certain judge once levied on them. A criminal suit was brought against William Rockefeller, Alexander Cochrane, George F. Baker, Theodore N. Vail and nine other directors of the New York, New Haven and Hartford Railroad Company, to find out whether the looting of some $200,000,000 could be charged to any individuals; but the jury acquitted six and disagreed as to the others. The Corn Products Company was told to give a $50,000 bond for good behavior and so was the National Starch Company. The criminal suit against the Cudahy Packing Company was not pressed; the heads of the concerns constituting the Wire Rope Association and the Rubber Covered Wire Association were fined from $5,000 down to $100 each; the great DuPont concern paid the costs and reorganized; the sugar trust asked that its case be held open until decisions were reached in the Harvester and Steel trust cases; in very many other cases small fines were imposed or the government lost, or the cases were appealed and held up under technicalities.

To strengthen the Sherman law, the Clayton Trust Bill was passed and approved 12 Feb. 1913. This prohibited certain monopolizing contracts, popularly called "tying" contracts, by the use of which the United Shoe Machinery Company especially had built up and held an immense monopoly. (Such contracts absolutely choked off competition.) This law permits any person to sue in any District Court where a trust has an agent, and to recover three times the damage sustained by any violation of the Sherman law, also his attorney's fees. It also aimed to stop interlocking directorates and to check many objectionable practices by corporation officers. Labor unions were expressly exempted from its provisions. Much was expected of this Clayton law, but the United Shoe Machinery Company won its case on the appeal to the United States Supreme Court and writes what contracts it pleases, and the other trusts go merrily on much as they used to. Most of the States passed anti-trust laws of one sort or another, as notably New Jersey, under the Wilson administration; but these laws have been even less effective than the Federal laws, because the State seldom has much jurisdiction over a trust that does business all over the world. The Federal Trade Commission was then created on much the same lines as the Interstate Commerce Commission, and of this body much is hoped. It has headquarters in Washington, and the five commissioners, appointed by the President, receive each $10,000 salaries, no more than three to be of one party. So they seem to be well removed from influence. They began their work late in 1914 and conducted the newsprint, the book paper and the bituminous coal investigations. The International Paper Company was accused of creating a corner in paper early in the war, and the newspapers said they cleared up about $25,000,000 in a few months. For this six of the officials paid fines of $2,500 each. Just as it began to look as if the Federal Trade Commission really might do something to alleviate the evils of trusts, the United States entered the World War, the government took over the railways and various other large manufacturing plants and industries, and investigations ceased. After the war in 1919 the meat-packing interests were being investigated.

The trusts are not the menace to democracy that they have been pictured; they have improved methods and reduced costs in many ways; they have shown that competition is not the life of trade, that it entails much waste; in many lines of endeavor they have built up great businesses legitimately and won success because they deserved it; in other lines, though they monopolized, they now so control everything that it cannot be taken away from them, as there are no other concerns that know how to handle the business. Germany has demonstrated to us that concentration of interests tends to reduce costs and increase efficiency. Their form of monopoly was called the kartell, and in some of them, as the potash and sugar kartells, the government participated. American industry must maintain and improve its efficiency, and big business must continue wherever it handles things better than can groups of small concerns. It appears that we cannot crush the trusts if we would, for the trusts represent both the capital and the brains of American industry. Therefore the trusts must be reformed where they need reforming.

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Federal Anti-Trust Laws' (1907); Taft, 'Labor and Capital' (1908); 'Prosecutions Under the Sherman Anti-Trust Law' (1911); Tarbell, 'History of the Standard Oil Company' (*McClure's Magazine,* 1904); 'The Trust, its Books' (1902); United States Industrial Commission, 'Report' (1900–02); 'Federal Anti-trust Decisions' (1907); Von Halle, 'Trusts or industrial Combinations and Coalitions in the United States' (1895); Walker, 'History of the Sherman Law' (1910); Taft, W. H., 'The Anti-Trust Act and the Supreme Court' (1914); Crowell, J. F., 'Trusts and Competition' (1915); 'President Taft and the Sherman Law' (1912); 'President Taft and the Railroads' (1912); Brown, W. J., 'Prevention and Control of Monopolies' (1915); Shale, 'Decrees and Judgments in Federal Anti-Trust Cases — 1890–1918' (Washington 1918); Federal Trade Commission 'Reports.'

TRUTH, Sojourner, American negro lecturer: b. Ulster County, N. Y., about 1790; d. Battle Creek, Mich., 26 Nov. 1883. She was held in slavery even after its abolition in the State. In 1827 she escaped, discarded the slave name Isabella, and chose the above fanciful appellation — Truth — as the substance of her Message and Sojourner because it was divinely revealed. Though quite illiterate, she spoke with much natural talent on emancipation and other reforms. Consult 'The Narrative of Sojourner Truth' (1884).

TRUTH, The. At the time of his death in 1909, Clyde Fitch was enjoying a British and Continental reputation equal almost to his popularity at home. His psychological study, 'The Truth,' had been widely received; his melodrama, 'The Woman in the Case,' had just been hailed in London. There is no doubt that any estimate of Fitch as a dramatist — his prolific pen turned out over 30 original plays, not counting dramatizations and adaptations from the French and German — must rank as high, in technical vividness and psychological achievement, 'The Girl With the Green Eyes' and 'The Truth,' usually grouped together as his most acute feminine studies. Both were written for the actress, Mrs. Clara Bloodgood; and both were pondered over long before pen was put to paper. As answer to the critics who continually believed Fitch to be a hasty spinner of slight feminine studies, one notes in the dramatist's correspondence that as early as 1894 he was speaking to friends of the "jealousy play" to be written. Eight years later, 'The Girl with the Green Eyes' was finished.

'The Truth' was equally as carefully thought out, and is as incisive in its study of the snares and tragedies of lying, as the former is of jealousy. It was presented in New York, 7 Jan. 1907, and was not a financial success, though it was praised for its distinction of style. From the time, however, it was given in London, at the Comedy Theatre, 6 April 1907, with Miss Marie Tempest as Becky Warder, it was universally praised as a technical triumph of revelatory psychology,— showing logically, relentlessly, yet deftly, how a woman's habit of lying over slight things, that might be explained away, leads to unhappiness and dire tragic ends.

'The Truth' has had a worthy stage history in Germany, Italy, Russia, Hungary and the Scandinavian countries. It was revived by Mr. Winthrop Ames, at the New York Little Theatre, on 11 April 1914.

MONTROSE J. MOSES.

TRUXILLO, troo-hēl'yō. See TRUJILLO.

TRUXTUN, trŭks'tŏn, **Thomas,** American naval officer: b. Long Island, N. Y., 17 Feb. 1755; d. Philadelphia, Pa., 5 May 1822. He was impressed into the British navy in 1767, and in 1776 was offered a commission which he refused in order to enlist in the cause of the colonies. He was appointed lieutenant in the American navy in 1776, and assigned to the *Congress,* equipped and commanded the *Independence* in 1777 and was later in command of the *Mars* with 20 guns. He cruised about the English Channel, greatly damaging the British merchant marine, and in 1781 was appointed to command the *Commerce* with 30 guns. His engagements throughout the war were uniformly successful. After the conclusion of peace he was employed for several years in the West India trade, but in 1798 upon the organization of the United States navy he was appointed one of its six captains and assigned to the frigate *Constellation,* with which, in 1799, he captured, after a severe battle, the powerful French ship *L'Insurgente,* and in 1800 *La Vengéance.* He was made commander of the West India squadron in 1801 with the rank of commodore, and in 1802 was appointed to command the expedition against Tripoli, but he retired from the service in that year. He wrote 'Remarks, Instructions, and Examples relating to Latitude and Longitude, also the Variation of the Compass' (1794).

TRYON, trī'ŏn, **Dwight William,** American painter: b. Hartford, Conn., 13 Aug. 1849. He studied art at Paris under De la Chevreuse, Daubigny and Guillemet and at the Ecole des Beaux-Arts. In 1886 he was appointed director of the Hartford School of Art; subsequently held the chair of art at Smith College, Northampton, Mass., and finally settled in New York. He is well represented in all public collections in America, especially in the National Gallery, Washington, and in the Metropolitan Museum of Art, New York. He has been awarded numerous medals and other testimonials to his skill and success as one of the foremost landscape painters of this country.

TRYON, SIR **George,** English naval officer: b. 4 Jan. 1832; d. off Tripoli, 22 June 1893. He entered the navy in 1848, served in the Crimean War, in 1861 became commander of the *Warrior,* the first British sea-going ironclad, and in 1874–77 commanded the *Raleigh.* He was secretary of the admiralty in 1882–84, became vice-admiral in 1889, in 1891 was appointed to command the Mediterranean station, and in 1893 perished in the flagship *Victoria* in collision with the *Camperdown,* due to his error during naval maneuvers off Tripoli.

TRYON, George Washington, American conchologist: b. Philadelphia, Pa., 20 May 1838; d. there, 5 Feb. 1888. He was educated at the Friends' School of Philadelphia, and in 1865 originated the movement for the construction of the present edifice of the Philadelphia Academy of Natural Sciences. In 1865–71 he was the

editor of the *American Journal of Conchology*. His publications include 'Synopsis of the recent Species of Gastrochænidæ' (1861); 'Monograph of the Order of Pholadacæ' (1862); 'Monograph of Terrestrial Mollusks of the United States' (1865); 'Land and Fresh-Water Shells of North America' (1873); 'American Marine Conchology' (1873); 'Structural and Systematic Conchology' (3 vols., 1882); 'Manual of Conchology' (12 vols., 1879–85), etc.

TRYON, Thomas, English dietist: b. near Cirencester, England, in 1634; d. 1703. He worked at carding wool as a boy and tended sheep until 18, when he drifted to London. At the age of 48 he wrote a series of pamphlets recommending water, bread and fruit as food and drink. His book called 'Health's Grand Preservative' (1682) was republished (1691) as 'The Way to Health' and attracted the attention of Benjamin Franklin.

TRYON, William, British colonial governor in America: b. in Surrey, England, 1729; d. London, 27 Jan. 1788. He served with ability in the British army, arrived in North Carolina as its lieutenant-governor in 1764, succeeded Governor Dobbs on the latter's death in 1765, and in 1771 was made governor of New York. In both colonies he was noteworthy chiefly for the cruelties of his administration. In North Carolina he suppressed the Regulators (q.v.) and displayed much inhumanity toward his prisoners. During the Revolution he led in person expeditions which destroyed the Connecticut towns of Danbury, Fairfield and Norwalk. In 1778 he resigned and went to England, where he became lieutenant-general in 1782.

TRYPANOSOMA, a genus of flagellate Protozoa included in the order Binucleata which are characteristic parasites of vertebrates and insects. Related genera live in the gut of insects but Trypanosoma is parasitic in the blood of vertebrates (except *Tr. equiperdum*). The species are transmitted by blood-sucking insects, especially the biting flies (Glossina), and it is probable that a sexual generation is developed in the insect in alternation with the asexual generation in the vertebrate host.

The species are difficult to characterize and thus far are distinguished only by culture experiments. The number of known forms and of diseases produced by them is rapidly increasing. Among the most important are the following: *Trypanosoma lewisi* from the rat, transmitted by fleas and lice, cosmopolitan, probably not pathogenic. *Tr. brucei* in cattle, horses, mules and wild herbivores, transmitted by Glossina, produces nagaña or tse-tse fly disease. It occurs in Africa south of the Sahara. *Tr. equiperdum,* in horse and ass, transmitted by contact (and by biting flies?) produces dourine. It is endemic in the circum-Mediterranean area and has been introduced into nearly all regions, including North America. *Tr. evansi,* in domestic and wild mammals, transmitted by Stomoxys and Tabanus, produces surra in India, China and the Philippines. *Tr. equinum,* in horses, causes mal de caderas in South America. *Tr. gambiense,* in man, transmitted by Glossina, produces sleeping sickness. It occurs in equatorial Africa (elsewhere by importation).

The most of the diseases named are very severe and recovery is rare so that these parasites rightly rank as the most dangerous known.

HENRY B. WARD.

TRYPETIDÆ, the family of fruit-flies (q.v.).

TRYSA, an old city in southern Lycia. It is interesting as the site of an ancient funeral monument with sculptures derived from Greek models representing famous battle scenes. The sculptures were taken to Vienna in 1883.

TSAR, tsär. See CZAR.

TSARITSYN, tsär-ĭt'zĭn, or **TZARITZIN,** zär-ĭt'zĭn, Russia, in the government of Saratov, on the Volga, 230 miles northwest of Astrakhan. It contains the remnants of old fortifications, a castle, seven churches, a mosque, theatre, schools, banks, etc. It is a railway centre and has numerous factories, machine works, tanneries, brickyards and canneries. It carries on a brisk transit trade in Baku petroleum, corn, timber, fish, salt, wool and meals, in the country included between the Don and Volga rivers. Pop. 100,817.

TSARSKOYE-SELO, tsär-skō'ĭ sā'lō, or **ZARSKOJE-SELO** ("Tsar's Town"), Russia, a town in the government of Petrograd, 14 miles south of the capital, with which it is connected by rail. It was the favorite summer residence of the Imperial family, and was founded by Peter the Great. In 1744 the Empress Elizabeth erected the magnificent palace, which Catherine II decorated at great expense. The principal front is about 1,000 feet long. The interior is gorgeously ornamented, the walls of some of the rooms being covered with amber, mother-of-pearl, jaspers, agates and other precious stones. This palace was not occupied by the Imperial family for many years before the Revolution of 1917. The palace grounds, which are 18 miles in circumstance, are finely laid out, and offer every variety of landscape.

TSCHAIKOWSKY, chī-kŏf'skĭ. See TCHAIKOVSKY.

TSCHERMIGITE, chĕr'mĭ-gīt, native ammonia alum. It occurs at Tschermig, Bohemia, in white, fibrous masses, vitreous in lustre, transparent or translucent, with a hardness of one to two, and a specific gravity of 1.50. It is a hydrous sulphate of aluminum and amonium. It is extensively manufactured from the residues of gas works and is used as a substitute for potash alum.

TSCHUDI, choo'dē, **ÆGIDIUS** or **GILES,** Swiss historian: b. Glarus, 5 Feb. 1505; d. there, 28 Feb. 1572. After receiving an education at Basel, Vienna, and Paris, he traveled for a time and served in the French army, 1536-44. He was the chief magistrate of Glarus in 1558, but on account of his opposition to the Reformation, the spread of which he attempted to suppress by force of arms, was banished in 1562. He was recalled in 1564 and spent his remaining years in arranging historical matter which he had collected. His 'Die uralt wahrhaftig alpisch Rhetia' was published as early as 1538, but his chief works, the 'Schweizerchronik' or 'Chronicon Helvetiorum,' covering the time from 1100 to 1470 and the 'Beschreibung Galliæ Comatæ,' were not printed till

1734–36. Modern research has shown that his historical statements are unreliable.

TSÊNG KI-TSEH, or **MARQUIS TSENG.** Chinese statesman: b. Hunan, 1837; d. 1890. He was appointed Minister to Great Britain and France in 1878, and in 1880 was given an embassy at Saint Petersburg where he negotiated the treaty restoring Kulja to China. In 1885 he negotiated a convention with Great Britain in regard to the opium traffic. In 1886 he returned to Peking and in 1887 was made vice-president of the board of revenue.

TSETSE-FLY, an African gadfly (*Glossina morsitans*), noted for the deadly effect of its bite in many cases on warm-blooded animals, but which is regarded as usually harmless to man. It is about the size of a house-fly, brown, with a few yellow stripes across the abdomen. The symptoms of a bitten animal are at first those of a severe cold; the eyes, nose and mouth begin to run, the body then swells, while emaciation sets in. The harm done does not result from a poison in the mouth of the fly, as formerly supposed, but from the communication to the blood of the victim of a microscopic blood-parasite similar to that of Texas fever, which it has received from a diseased animal and carried to another. Tsetse-flies not themselves infected with parasites are thus harmless. Cattle and other animals which recover from the disease are usually immune, and attain a similar immunity after residing for a time in South Africa. The great dread of this fly formerly entertained has, therefore, proved to be unjustified.

TSIMSHIAN, tsĭm-shē-ān' ("people"), a group of North American Indian tribes, forming the Chimmesyan linguistic stock, residing between the Nass and Skeena rivers, British Columbia, together with the adjacent territory and the islands off the coast. They subsist chiefly on the products of the rivers and the sea, especially salmon and oolachen, the latter furnishing large quantities of oil. They also hunt bear, mountain goats and other large game, the horns of the goats being carved into spoons and ladles which are used in their communal feasts. They also make dug-out canoes, but most of their boats are purchased from the Haidas. Their houses are constructed of immense cedar beams and planks and often are large enough to accommodate a hundred persons, who are presided over by a house chief. Each family and town also has its special chief. The population of the tribes forming the stock is about 3,200, including about 750 forming Duncan's colony at New Metlakahtla on Annette Island, Alaska.

TSINAN-FU, tsē'nän'foo', China, the capital of the province of Shan-tung, situated near the south bank of the Hoang-ho River, 220 miles south of Peking. It covers an area of about 10 square miles, within the earthen wall that surrounds it. There are excellent public buildings, an enormous assembly room, fine temples, an old tower and a Romish cathedral. There is a railway, begun by the Germans and taken over by Japanese capital. Pop. about 250,000.

TSING-TAU, or **TSINGTAO,** China. See KIAO-CHAU; SHANTUNG.

TSITSIHAR, or **CICIKAR,** tsēt-sē-kär', Manchuria, capital of the province of Hilung-Chiang, situated on the Nanni, a branch of the Sungari River, near the Mongolian frontier, 500 miles northwest of Vladivostok. It is an important station on the Eastern Manchurian Railroad, has large fairs and a considerable traffic in furs and grain. Pop. about 30,000.

TSU, an old castle town of Japan, capital of Miye prefecture, on the bay of Ise and connected by railway with Nagoya, 46 miles distant. It has modern buildings and newspapers. Intersected by two rivers, its seaport is at the Iwate river's mouth. It is noted for its manufactures of porcelain, fans and parasols. Nearby is Shirako, famous during nearly a thousand years, for its artistic designs and patterns for textiles, which have been copied all over Japan. Pop. of the prefecture 1,101,573, of the city 47,295.

TSU-SHIMA, tsoo-shē'mä, Japan, an island in the Korea Strait, about midway between Korea and the Japanese island of Iki Shima. It is 50 miles long by 10 miles wide, and divided near the centre by a small sound. It was off this coast that Admiral Togo won the principal naval victory in the war with Russia in 1905. Pop. 38,636.

TSUBA, tsū-bäh, the Japanese sword guard, unlike the early Chinese and European sword guards which were wrought into the blade, was a distinctly separate piece of metal, through which the blade passed. Originally, in prehistoric times, the tsumiba, or "blade-clincher," was heavy, of gilt copper and ovate shape. In its development, securing strength with lightness, it came to be, from the 16th century onward, a work of art also. The tsuba reached the highest expressions of pure design and representation of faith and motive, as well as of imagination, while serving in practical usefulness. It became the focus of Japanese art in metal; thickly colored alloys, silver and gold were made use of to express permanently, on iron, unique artistic conceptions, standard and orthodox symbols, and the complete repertoire of Japan's religious, mythological, poetic and literary lore, as well as personal tastes and preferences. Various schools of designers and workers were developed, whose products the experts easily recognize. Perhaps nothing else of Japanese conception or expression in art excels the tsuba as a revelation of the native mind and characteristic features of Japan's civilization. On the abolition of sword wearing by civilians, in 1871 — optional at first and later compulsory — probably a million blades were thrown on the market to be made into domestic tools or laid away in museums. Their wooden scabbards — most probably an evolution from the Malay original, with its loose case of wood — were often lacquered in characteristic and costly style, but their metal ornaments, especially the guards, were in the main preserved. At once art connoisseurs of Europe and America, perceiving this rich find in the artistic field, became eager collectors, so that the private cabinets and public museums compete eagerly for notable or unique specimens. Consult Okabe-Kakuya, 'Japanese Sword Guards' (Boston 1908).

TSUNG-LI-YAMEN, tsoong' lē' yä'mŭn, the department of foreign affairs in the Imperial Chinese government. It is now superseded. See CHINA.

TU FU, Chinese poet: b. Siangyanfu, about 712; d. 770. He gained the favor of the reigning emperor but had a stormy life until 761 when he was given a post in the Board of Works which he held for six years. His book containing 1,405 compositions was issued in 1059. Consult Giles, H. A., 'History of Chinese Literature' (New York 1901).

TUAM, tū'ạm, Ireland, an ancient town in the county of Galway, Connaught, 126 miles west by north from Dublin. It is the seat of the Roman Catholic archbishop, and of the Anglican bishop of Tuam. Its principal edifices are the Protestant and Roman Catholic cathedrals, the bishop's palaces, the college of Saint Jerlath, for the education of Roman Catholic clergy; the courthouse, national and other schools. The manufactures are confined to canvas and a few coarse linens; there is some trade in grain. Pop. about 3,000.

TUAMOTU, twä-mō'too, or **PAUMOTU** (pow-mō'too) **ISLANDS,** or **LOW ARCHIPELAGO,** Polynesia, a group of islands in the Pacific Ocean, belonging to France, and situated between lat. 14° and 25° S., and between long. 124° and 148° W., south of the Marquesas Islands, and east of the Society Islands. The group consists of about 80 atolls with a combined area of 366 square miles. They are, with a few exceptions, of low coral formation, and the surrounding waters are beset with reefs. Cocoanuts, yams and bread-fruit, and pearl, are about the only products. Pitcairn and Ducie Islands belong to Great Britain; the rest are French, and administered from Tahiti. The group was discovered by Quiros in 1606, and came into the possession of France in 1881. In 1903 a severe storm and flood visited the islands and many of the inhabitants perished. Pop. about 5,000. See FRENCH ESTABLISHMENTS IN OCEANIA.

TUAREGS, too-ä'rĕgz, **TUARICKS,** or **TAWAREK,** a fierce and powerful race of Berber origin, professing to be Mohammedans, but different in their practices, religious and social, from most of the believers in that faith. They are virtually independent, although roaming within the boundaries of several jurisdictions, French, Turkish and Moroccan. The tribe is often predatory, and members of it have been guilty of grave outrages on travelers in the desert. Both men and women are of fine physique, and the women go unveiled, and take part with the men in the public affairs of the tribe. Tuareg is the Arabic name for the tribe. They call themselves Imoshagh. See BERBERS.

TUATARA, too-ạ-tā'rạ, the native name of *Sphenodon punctatum,* a large lizard-like reptile formerly abundant on the mainland of New Zealand, but now restricted to some of the small islands off the coast and probably doomed to total extinction. It is the sole living representative of the order *Rhynchocephalia* and because of its great zoological interest as a relic of that ancient group should be preserved, and, indeed, it is protected by the Colonial government. It is about two to two and one-half feet long, with four strong, five-toed limbs, a loose-fitting scaly skin and a fringed crest extending from the head to the tip of the tail. In color it has olive sides and limbs with minute white specks, beneath yellowish; the spines of the nuchal and dorsal crests yellow, of the caudal brown. The teeth are completely coalesced with the jaws and palate to form two tuberculate ridges on each side posteriorly in the upper jaw, and a very hard polished beak in the front of the mouth. Most interesting skeletal features are the presence of two well-developed post orbital arches in the skull, the firmly-fixed quadrate bone, the long series of abdominal ribs and the presence of separate intercentra between the vertebral bodies. On the roof of the skull in the parietal bones is a conspicuous opening, the seat of the pineal eye, which in this animal reaches a high degree of development, but is shielded from the access of light rays by a heavy curtain of pigment which covers it.

These animals live in burrows which terminate in large chambers lined with grass. Certain species of petrels occupy the tuataras' burrows as nesting sites, and the two are reputed to live peacefully together. During the day the tuatara sleeps in its nest but issues at night to seek its exclusively animal food, which consists of insects, lizards, frogs, small birds, earthworms, etc., or along the seashore of crabs, marine worms and small fishes. They are pugnacious but sluggish creatures, and are very fond of lying in water. Sometime during the summer, from November to January, about a dozen eggs are deposited in a hole in the ground, and there they remain for about 13 months when, during the following summer, they hatch. Consult Howes, 'Transactions Zoological Society of London' (Vol. XV).

TUBA, *in music,* a brass wind instrument of the saxhorn family, the lowest as to pitch in the orchestra; it has five cylinders, and its compass is four octaves. It is utilized, since its introduction by Wagner, as the bass of the trombone choir. Also, a high pressure reed stop of eight-foot pitch on an organ.

TUBAL-CAIN. The son of Lamech and Zillah, and according to Gen. iv, 22, the inventor of the art of working in metals.

TUBBS, Frank Dean, American educator: b. Mexico, N. Y., 9 April 1864. He was graduated from the Ohio Wesleyan University in 1888 and received the degree of A.M. in 1893. From 1889 to 1894 he was professor of natural history at the Mexican Methodist College, Puebla, Mexico, from 1894 to 1897 was president of the South American School of Theology, Mercedes, Argentina, and from 1899 to 1901 was professor of biology and geology at Kansas Wesleyan University. In 1902–07 he was professor of science and in 1903–07 principal of Marion (Ohio) High School. In 1907 he became professor of geology and astronomy at Bates College, Lewiston, Me. In 1910–12 he lectured on science at the Bangor Theological Seminary. Professor Tubbs is author and translator of several works in the Spanish language and is well known as a lecturer on science and travels.

TUBE-WEAVER, a group of spiders (q.v.).

TUBE WELL, or **DRIVEN WELL,** a device for obtaining water from the soil, consisting of an iron pipe of small diameter, pointed at the lower end, and driven vertically down into the earth usually by means similar to those used in driving oil wells, until it pierces a water-bearing stratum. The tube is provided with a number of lateral perforations near its lower end, through which the water can enter it. In some cases the water exists in the soil under a pressure sufficient to cause it to flow up through the tube and out at the top; but more commonly a pump must be applied at the upper end, to draw the water up to the surface. When the well is to be driven to a depth greater than one length of pipe, the tubing is usually constructed in sections, which are united by means of screw connections; new sections being added at the upper end as the sinking of the well proceeds.

TUBER, a shortened, thickened, fleshy, subterranean stem in which the leaves appear as scales with axillary dormant buds, collectively called "eyes" in the potato, and Jerusalem artichoke, which are good examples. Internally they contain starch as a principal component. Tneir office is to act as reservoirs of food and to propagate the species when favorable conditions present. Plants which bear tubers are all perennials.

TUBERACEÆ. See FUNGI.

TUBERCULIN, a culture used to test for the presence of the disease tuberculosis in cattle. Prepared as follows: The attenuated cultures of tubercle bacilli or germs are allowed to grow in broth containing glycerine. After growing for several weeks, the bacilli produce certain toxic or poisonous substances which are soluble in and hence dissolved in the broth. The toxic solution is filtered from the bacilli and becomes the solution tuberculin. The process of manufacture has been subject to much variation. When injected in small quantity into a healthy animal it produces no effect, but if the animal has the disease tuberculosis it causes a decided rise in bodily temperature and hence can be used as a test for that disease. It was originally introduced by Professor Koch of Berlin, and hailed as a cure for consumption, on the principle of vaccination for hydrophobia. It proved ineffective, but is by some deemed useful as a test. Consult Cochrane and Sprawson, 'Guide to the Use of Tuberculin' (1915).

TUBERCULOSIS, an infectious, communicable disease caused by the bacillus of tuberculosis. The bacillus induces the formation of little nodules called tubercles. These tubercles may grow in size through the continued action of the organisms; they may soften, break down and be expelled, leaving behind an ulcer or a cavity; they may become hard by a process of sclerosis; or they may calcify. In addition to the local manifestations the disease produces general symptoms like elevation of the body temperature, increased pulse-rate and loss of weight. It is popularly known under a variety of other names as consumption, phthisis, decline, debility, hectic fever and when localized in a special part or tissue, as Pott's disease or hunchback, scrofula, hip-joint disease, white swelling (tuberculosis of elbow) and lupus (tuberculosis of skin). Contrary to prevalent lay opinion, when properly treated, it is a very curable affection.

Distribution of the Disease, Geographical. — Tuberculosis is the most universal of all diseases. It is found in every part of the world, and has been known from the beginning of history. It was accurately described by Hippocrates (460 B.C.), and by Galen (200 A.D.). It is most prevalent, however, in large cities and especially in overcrowded districts.

Distribution According to Race.— No race is exempt, but some races appear less resistant than others. Indians, when brought into civilization, prove especially susceptible. Among the other races in this country the negroes seem to be the most susceptible with next in order the Irish, while Jews stand at the end of the list. In the general mortality about one-tenth and in the mortality between the ages of 15 and 60 about one-fourth of all deaths are due to it. The number of clinical cases in a community is about 10 times the number of deaths in a year (Rosenau). Eighty per cent of these manifest it in the lungs.

Distribution Among Animals.— Most animals are more or less susceptible. Among domestic animals it is found most frequently in cattle and swine, though sheep and horses are not exempt. Dogs and cats manifest it rarely. It is also found in birds (fowl) and fish. Wild animals in their native haunts seem less susceptible, yet in domestication it is the most common cause of death. Rabbits, guinea-pigs, rats and mice may acquire it. Guinea-pigs are especially susceptible to experimental inoculation and are, therefore, commonly used for this purpose. Though frequent in adult cattle, it is infrequent in calves (Nocard), showing that direct heredity plays no part.

Etiology (Causation).— The actual cause of the disease is the tubercle-bacillus described by Robert Koch in 1882. This is a minute vegetable non-motile organism in the shape of a rod or lead-pencil, measuring about three microns ($\frac{1}{11000}$ of an inch) in length, and about four to six times longer than broad. It is visible only under the higher powers of the microscope, a $\frac{1}{12}$ oil-immersion lens being usually used to study it. Its principal characteristic is its behavior toward aniline dyes. It requires the strongest dyes to stain it, but when stained it holds the dye so tenaciously that exposure even to strong mineral acids for a reasonable time fails to decolorize it. This characteristic furnishes the most ready means for its recognition. It is quite parasitic in nature, growing on but few artificial media, namely, blood-serum, glycerine-agar, bouillon or potato, best on the first. It grows only at the body temperature (37° C.). It is slow in growth, and becomes apparent only from 5 to 14 days after inoculation of the medium. Exposure moist to a temperature of 60° C. for 15 minutes, or boiling, kills it, though freezing has no effect on it. It is killed by direct sunlight within a variable period of time (from 15 minutes on), depending on the season and the character of the medium containing the organism; by diffuse sunlight near a window in a week or two. In growing (either parasitically or without the body) the organism elaborates a chemical product highly poisonous to most animals. It

is this poison circulating in the blood which produces the general symptoms of the disease, such as fever, increased heartbeat, emaciation, etc. Tubercle-bacilli found in different animals differ in their characteristics. The human, bovine, avian and fish varieties have been differentiated. One of the principal points to be noted is the slow propagation of the organisms with the consequent slow development of the disease. The actual infection usually precedes the manifestation of the disease by scarcely ever less than two and frequently as many as 20 years.

Predisposing Causes.— Though the bacillus of tuberculosis is the actual cause of the disease whenever it occurs, other factors require consideration. As wheat will not grow on every soil, so the tubercle-bacillus will not grow in every individual. In fact it would appear that the majority of human beings are quite insusceptible, and that as a rule an overwhelming dose of the organisms repeated frequently for some time is necessary to overcome the resistance. All the conditions necessary to produce susceptibility are unknown, yet it is empirically true (and could be with reason supposed) that any circumstance which tends to lower the general vital resistance decreases the resistance to tuberculosis. Therefore, defective and insufficient food, over-work, worry, chronic alcoholism, surroundings like a damp, dark, overcrowded dwelling, persistent irritation of a somewhat naturally susceptible part of the body, as irritation of the lungs by the constant inhalation of dust (mine-workers, stone-cutters, etc.), previous severe disease like typhoid fever, etc., all tend to increase the susceptibility.

It was thought in the past that the most common cause active in the production of susceptibility was heredity, because the disease manifests itself more commonly in the children of the tuberculous than of the non-tuberculous. Recognizing the communicability of the disease, however, the closeness of the contact after birth easily accounts for this, without it proving them more susceptible. In fact, a strong argument can be deduced to the contrary, namely, that the children of tuberculous parents are less susceptible. Granting the communicability, it is not a surprise that children who are kissed and fondled for years by tuberculous mothers contract it, but it is a surprise if any escape; and if they were more susceptible we would expect them to contract it in such a virulent form that no child of a tuberculous mother would ever reach adult age. The fact is, however, that the majority of children of tuberculous parents never manifest the disease and the ones who do usually manifest it in a very chronic fashion and only after the age of 15. In other words, though these children live in an atmosphere impregnated with the germs, the majority fail to contract it and the remainder resist it for years.

Flick's paper on tuberculosis as a house-disease goes to prove its communicability. He investigated all the houses of the largest, oldest and most thickly populated ward in Philadelphia, and found that the deaths from tuberculosis in that ward were disproportionately large in certain houses. In short, he demonstrated case after case of apparently healthy families moving into a house previously occupied by a tuberculous person with the result that one or more members died of the disease.

Modes of Infection.— There are four possible modes of infection, namely, inoculation, heredity, inhalation and ingestion.

Inoculation.— Villemin's work, supplemented by that of Cohnheim and Salamonson, absolutely established the fact that the disease was inoculable. Inoculation is, however, quite rare as a method of general infection in human beings, and its occurrence is practically limited to special occupations. Inoculation with the production of a strictly limited local lesion is reasonably common on the hands of physicians who do anatomical or post-mortem work (the post-mortem wart, the *leichen*-tubercle of the Germans), of butchers, tanners, etc. Local tubercles have also been produced by piercing the ears for earrings, by tattooing and by washing the clothes of a tuberculous patient. Both local and generalized tuberculosis have been reported as a result of the rite of circumcision, the last step in which is the sucking of the wound.

Heredity.— Up to the time of Villemin this was the generally accepted mode of acquiring the disease, though here and there down the centuries from the time of Galen some one has stood out against it in favor of contagion. Hereditary transmission has been experimentally proven on the lower animals (Gärtner), and occasionally demonstrated in human beings by the finding of tuberculous lesions in the fœtus. These proofs occur so rarely, however, that the ordinary view of practically all cases being examples of contagion, is fully warranted.

Inhalation.—The common belief at the present day is that the majority of cases of tuberculosis are the result of inhalation of the germs. The contagiousness of the disease being proven, and the infectious bacilli being found in the matter given off from a tuberculous ulcer (therefore, in the sputum in tuberculosis of the lungs), it is readily understood how people living with a consumptive may be more or less constantly inhaling the contagion. Nuttall's estimate of the number of bacilli thrown off in the expectoration daily could only make one wonder how anybody escapes the disease, were it not that they are so easily and quickly devitalized. In a case where the patient expectorated about four ounces daily, Nuttall estimated the number of bacilli to be from one and a half to four billions in the 24 hours. Experiments on animals with the dust of rooms occupied by tuberculous patients have usually proven positive (Cornet). The arguments for inhalation as the most common mode of infection are: (1) the very great frequency of tuberculosis of the lungs; (2) the frequency with which all persons are exposed to this form of contagion.

Ingestion.— For years it was thought that tuberculosis of the lungs was the result of inhalation of the germs, and abdominal tuberculosis the result of ingestion with food or otherwise. The argument favoring this view appeared plain; namely, that primary mesenteric gland tuberculosis is almost limited to children, especially the bottle-fed. Living as they do entirely on cows' milk, and considering the susceptibility of horned cattle to tuberculosis, the inference seemed so justified that scarcely any

exception was taken to it. In addition, adults who live as a rule on cooked food scarcely ever show mesenteric gland tuberculosis as a primary infection, but practically always tuberculosis of the lungs, which would readily seem to be the result of contact with the disease in their occupation, sleeping-rooms, etc. This plain view of the matter has, however, undergone a change. The majority of clinicians and pathologists of our day believe that children manifest the mesenteric form more frequently simply because these glands are more susceptible at that age, and adults the pulmonary form for an analogous reason. For several years at the end of the 19th century considerable was written to prove that practically all cases of tuberculosis were the result of ingestion of the germs. It was contended that even in tuberculosis of the lungs the germs entered through the digestive tract, passed into the chyle-vessels with the fat, were carried through the thoracic duct to the heart and took up lodging in the lung on account of its non-resistive power. The experiments about this time demonstrating the infectivity of cows' milk became so numerous (Gerlach, Bang, Bollinger, Ernst) that the question of the digestive tract as a probably common route (if not actually the most common) seemed practically settled. At the British congress on tuberculosis in 1901, however, Koch threw a shell which scattered scientific physicians and left them in two hostile camps. Coming from any one else the opinion (for it was scarcely more than an opinion, being based on a small number of experiments) would have been scoffed at, but coming with Koch's authority it could not fail to arouse interest and even advocates. Koch affirmed that the difference between the bovine tubercle-bacillus (that is, the bacillus causing disease in cattle) and the human tubercle-bacillus was such that one was not contagious to the other species, or was so slightly contagious that the number of cases of tuberculosis thus produced might be left out of consideration without impairing statistics. During the past 18 years the efforts to disprove Koch's statement have been numerous, but the question is not yet absolutely settled. Our investigations are conclusive enough, however, to lead us to believe that about 5 per cent of the cases in human beings are due to the bovine bacillus. Practically all of these are in the lymphatic glands of children, or in other extra pulmonary locations; the number in the lungs of adults is negligible.

Primary and Secondary Infection.— The belief is gradually gaining ground that the ordinary manifest tuberculosis of the lungs is a result not of primary but of secondary infection. Inoculation experiments on animals have always shown primary inoculation to produce tuberculosis of the nearest lymphatic glands with no lesion at the site of inoculation, and secondary inoculation to produce no lesion of the lymphatic glands with definite tuberculosis at the site of inoculation. It would appear, therefore, that pulmonary tuberculosis is the result of secondary rather than primary infection and occurs in one of the following ways: The individual ingests tubercle bacilli, which pass through the intestinal wall without producing a lesion, but cause tuberculosis of the mesenteric, and later the bronchial glands. The disease of the bronchial glands produces stasis of the lymphatic circulation in the lung, with a consequent retrograde flow of lymph, which carries the tubercle bacilli from the glands to the lung tissue. Or after the lymphatic glands have become involved an entirely new infection by inhalation or ingestion produces the pulmonary manifestation. A number of investigators (prominent among them Bushnell) believe that the primary infection practically always occurs in childhood and that adult infection is extremely rare.

Pathology.— When the tubercle bacilli are deposited in a tissue they proceed to multiply. Like other plants in growth, they take from their surroundings the chemical elements necessary. The living cells from which this material is taken die. In addition, the growing bacilli throw off waste products containing a poison (toxin) which kills other cells. We soon, therefore, have the tubercle bacilli in a mass of dead débris. A reaction now occurs on the part of the healthy tissue to prevent extension — the cells of the part multiply, and white blood cells wander in from the blood for the purpose of consuming the organisms. It is this mass of bacilli, débris and new cells which constitutes the tubercle described first by Baillie in 1794, and which is the specific lesion of the disease no matter in what organ it occurs. The débris looks like a soft cheese, and is called caseous material or caseation. The new cells are called epithelioid. Usually a tubercle also shows what we call a giant cell, a cell three to eight times larger than the epithelioid.

The question of the cure of the tubercle seems to depend on whether the epithelioid cells or the tubercle-bacilli obtain the upper hand. If the epithelioid cells are manufactured more rapidly than the tubercle-bacilli destroy them they form a dense wall about the tubercle-bacilli, elongate, become fully formed fibrous connective-tissue cells, thus shutting the bacilli up in a capsule, and the bacilli die, while the caseous material calcifies or is absorbed and replaced by scar-tissue or fibrous tissue. When the amount of fibrous tissue in the lung is large we speak of fibrosis of the lung. If, however, the bacilli are victorious the tubercle may grow larger and, coming in contact with other tubercles, form what is known as a conglomerate tubercle, and so continue until even a whole organ is involved. Again, the caseation may advance so rapidly, especially in the lung, that there is never any sharp demarcation between healthy and diseased tissue. This is generally called diffuse tuberculosis, and in the lungs is known as caseous or tuberculous pneumonia.

Finally, as the tubercle advances, other micro-organisms (particularly streptococci or staphylococci) may gain entrance to the caseous material and break it up. If now the tubercle, in growing, reaches a surface its liquid contents may be expelled, leaving behind an ulcer or a cavity. This happens most frequently in the lungs, and the resultant cavity may be of any size from a pea to that of a whole lobe of the lung.

The cavity is usually within the lung, or if at the margin, is limited by the pleura, which thickens about it. Sometimes, however, it breaks through the pleura, allowing pus into the

pleural cavity, which is called pyothorax or empyema; occasionally both pus and air are admitted producing pyopneumothorax.

When newly formed, tubercles appear to the naked eye as grayish-white or yellowish-white specks about the size of a millet seed, hence the name miliary tubercle. When two or more of these fuse, it is called a conglomerate tubercle. Usually the disease, especially in the lungs, progresses by a small number of tubercles localized in one area running together to form conglomerate tubercles and these again to form a larger mass which we call tuberculous infiltration. Sometimes in non-resisting cases miliary tubercles develop rapidly all through the lung and rarely in many other organs and the individual dies before they become conglomerate. This condition is described as miliary tuberculosis. In growth tubercles destroy the tissue which they replace and even when cure results, they only change to masses of scar tissue; the original tissue never returns.

Lymph-Gland Tuberculosis.— Children are most frequently the victims, and the bronchial, cervical and mesenteric are the glands of predilection. Tuberculosis of the cervical lymph-glands is popularly called scrofula. It is treated in a similar way to chronic tuberculosis of the lungs by rest, fresh air and nourishment, or by the X-ray, which appears to be frequently successful. When the glands break down, surgical interference is usually necessary.

Bone Tuberculosis.— This is likewise most common in children. It may be limited to the medulla or periosteum, and spread from either to the cortical portion, producing necrosis (tuberculous caries). It is most frequent at the joints, especially the hip and the intervertebral. Tuberculosis of the vertebral column is popularly called Pott's disease, or hunchback. It is usually associated with lumbar or psoas abscess. When localized to the vertebræ, cures are frequent. The treatment of Pott's disease and other joint tuberculous disease, like hip-joint disease, is similar to that of chronic tuberculosis of the lungs.

Intestinal Tuberculosis.— The intestines show either a miliary variety (the tubercle lying either beneath the mucous membrane or the peritoneum) or a chronic ulceration. Both forms are usually secondary to tuberculosis elsewhere. Miliary tuberculosis and tuberculous ulcers of the appendix are not uncommon, particularly in advanced tuberculosis of the lungs.

Laryngeal Tuberculosis.— This is manifested commonly by adults as a complication of advanced tuberculosis of the lungs. Its bad reputation, as far as cure is concerned, comes from the fact that it usually occurs only when the tuberculosis of the lungs is so advanced that the individual is incurable on account of the lung condition. When it occurs early in the case or as a primary affection, it is just as curable as tuberculosis elsewhere. The amount of hoarseness or pain does not indicate the seriousness of the condition. A small insignificant closed tubercle between the vocal cords may produce marked hoarseness; a small ulcer on the epiglottis may produce great pain; a large, much more serious ulcer when situated elsewhere may produce neither hoarseness nor pain.

The organs most commonly affected in adults are the lungs; in children, the lymph-glands, bones and joints. The other organs are affected much less frequently, and in about the following order: Intestines, peritoneum, kidneys, meninges, brain, spleen, liver, generative organs, pericardium, heart. Tuberculosis of the skin comes under the head of lupus (q.v.).

Symptoms and Prognosis of Tuberculosis of the Lungs.— It is necessary to differentiate three varieties, acute miliary tuberculosis, acute tuberculous pneumonia and chronic tuberculosis.

Acute Miliary Tuberculosis of the Lungs.—This may begin as a primary or be secondary to an acute or chronic affection elsewhere. It is most common as a termination of a chronic affection of the lungs. It comes on rather rapidly, like the ordinary acute infectious diseases, and is sometimes distinguished from them (especially typhoid fever) with difficulty. There is a loss of appetite, loss of flesh and strength, fever (102° to 104° F.), accelerated pulse, hurried respirations, a brown fissured tongue, delirium, then stupor and death. The duration is from two to four weeks. The prognosis is always grave, though no case of tuberculosis is ever so grave that treatment is surely in vain.

Acute Tuberculous Pneumonia.— This is practically always secondary to a chronic tuberculosis of the lungs. It begins, like lobar (ordinary) pneumonia, with a chill, high fever, rapid pulse, shortness of breath, hemorrhagic sputum, flushed face, and the physical signs of consolidation of parts of the lung. Instead of ending by crisis about the ninth day, like lobar pneumonia, it continues to a fatal termination; or the acute symptoms gradually subside, the diseased area becomes fibrous, and the patient gradually gets well, or approximately so, with a loss of lung-tissue equal to the involvement, which is sometimes an entire lung. The diagnosis is made by the ordinary signs of pneumonia and the tubercle-bacilli in the sputum. The prognosis is very unfavorable; rarely, however, a case recovers sufficiently to lead a useful life for a number of years. The treatment is that of chronic tuberculosis.

Chronic Tuberculosis of the Lungs.— This is what is ordinarily understood by consumption, or tuberculosis of the lungs without qualification. Its symptoms vary with the progress of the disease, and the susceptibility of the individual to the poison (toxin) excreted by the bacillus. The onset is usually insidious, and the disease frequently progresses for 5 to 20 years before the patient recognizes it. The symptoms are often brought out by a «cold» from which the patient seemingly does not recover. Many, therefore, attribute their disease to such a «cold.» The first noticeable symptom is sometimes a hemorrhage or a pleurisy; again, a progressive loss in weight or a slight dry cough, becoming gradually worse. The most important very early symptoms are usually slight fever, especially toward evening (which may or may not be accompanied by a chill), hectic flush, acceleration of the pulse-rate, cough, expectoration, loss in weight, progressive pallor of the skin, night-sweats, indigestion or loss of appetite, vague general pains, and soreness localized in the chest. The one positive

sign of tuberculosis at this stage is the finding of tubercle-bacilli in the sputum. If every lesion were open, that is, in communication with a bronchus, there would be tubercle-bacilli in the sputum from the earliest stages, and the diagnosis would be easy; but many lesions are closed, that is, completely encapsulated, and, therefore, show no bacilli in the sputum. Hence the physician must rely on other signs brought out by careful inspection, palpation, percussion and auscultation of the chest and X-ray examination.

As the disease advances, all the foregoing symptoms are intensified. The pulse-rate becomes more rapid, so that it is evident to the patient in palpitation or shortness of breath, the temperature rises to 102 or more, the loss of weight becomes excessive, frequently reaching one-fourth, sometimes one-third and rarely one-half of the usual weight, the pallor becomes marked, the appetite is completely lost, cough may become almost continuous day and night and of a most racking character, expectoration increases, the feet usually swell and the picture presented is known to everybody. The patient is extremely emaciated, the chest is quite flat, the depressions above and below the clavicles are marked and the scapulæ stand out prominently on the back. Hemorrhage may or may not occur. As a rule there is little or no pain. The lungs themselves possess no sensitive nerves, and it is only the associated pleurisy which occurs at intervals that produces this symptom. Examination by the physician now reveals the signs of extensive solidification. This may extend over one whole lung or over the greater part of both. It may or may not be associated with cavities.

Chronic tuberculosis of the lungs, when diagnosed sufficiently early, and when the personal resistance is good, is a very curable affection. This is proven by the number of cured lesions found at autopsy. It is very conservative to say that 50 per cent of all bodies coming to the autopsy table past the age of 35 (death having been the result of some other disease than tuberculosis of the lungs), show a healed lesion of tuberculosis of the lungs. The present post-mortem and clinical records demonstrate that 75 per cent of cases recover. Moreover, these post-mortem records are absolute; there is no practical question of diagnostic error. In addition, many cases with a lessened resistance can be so improved under judicious treatment that their lives are prolonged in comfort for 10, 20, even 30 years. For the encouragement of those afflicted, it might be stated that according to Jacobson the following appear to have suffered from tuberculosis: Cicero, Milton, Samuel Butler, Pope, Shelley, Hood, Keats, Elizabeth Barrett Browning, Francis Thompson, Goethe, Schiller, Molière, Richelieu, Mérimée, Thoreau, Calvin, Descartes, Locke, Kant, Spinoza, Mozart, Chopin, Paganini, Beaumont, Samuel Johnson, Sterne, DeQuincey, Scott, Jane Austen, Charlotte and Emily Bronte, Stevenson, Balzac, Voltaire, Rousseau, Washington Irving, Hawthorne, Gibbon, Kingsley, Ruskin, Emerson, Cardinal Manning, Raphael, Watteau, Bastien LePage, Marie Bashkirtseff, Cecil Rhodes and Laennec, as well as a large number of present-day physicians, who after developing the disease became tuberculosis experts, like Edward L. Trudeau, Lawrence F. Flick, H. R. M. Landis, Lawrason Brown, A. M. Forster, James Price, Estes Nichols and E. S. Bullock.

Diagnosis.— Only rarely is the diagnosis difficult. The comparison of the autopsy findings with the clinical diagnosis at the Henry Phipps Institute showed the physical signs of Laennec to be practically perfect. In addition, we have as aids the examination of the sputum, the X-ray and the tuberculin test. Of these the physical signs elicited by an expert are the most positive. The sputum may fail to show tubercle bacilli on account of the lesion being closed. The tuberculin test is practically absolute, though it does not tell us in what part of the body the tuberculosis is. It is very useful in the diagnosis of tuberculosis in cattle because we only wish to learn the fact of its existence and are not concerned about its location; but not so useful in human beings in whom we usually wish to learn the nature of a lesion in a particular place. The X-ray in advanced tuberculosis is about as accurate as physical signs, but in early lesions it frequently fails. It is likely that time will make the X-ray more accurate.

Treatment of Chronic Tuberculosis of the Lungs.— There is no known specific for the disease. Koch's tuberculin is used by the minority of physicians and by them only in selected cases. There are at present more than 25 different tuberculins (emulsions and sera) on the market, and almost every discoverer claims his is the only one beneficial. The most that can be said with certainty in regard to the treatment with any of them is that in expert hands in small doses they do no harm. In the hands of inexperience their employment is fraught with danger. Whether tuberculin is used or not, the most careful hygienic régime must be instituted. The disease progresses on account of a lack of resistance in the patient; the object, therefore, is to increase the resisting power. This is accomplished by rest, fresh air and good nourishment. If the disease is active, that is associated with fever, rapid pulse or rapid emaciation, or other serious symptoms, rest in bed is necessary. The patient should remain in bed until the temperature is below 99.6, the pulse below 100, serious symptoms in abeyance and gain in weight is evident. An early favorable case usually requires from two to six weeks rest in bed; advanced cases correspondingly longer. Even when ready to be up all day he should lead a regular life, retiring at a proper hour (before 10 P.M. if an adult), in order to get sufficient rest. He should have nine hours' sleep, must sleep alone and, when possible, in a room alone. The best situation for the room is on the southwest corner of the house. The windows of the sleeping-room should be kept wide open, no matter what the weather. In summer all the windows in the room, and in winter, when the air diffuses much more readily, one window at least, should be wide open. The idea is to make every inhalation one of fresh air. During the day the patient must spend as much time as possible out of doors, yet in summer he must not be in the sun. When the weather is cold he should be comfortably wrapped. It is better to multiply the coverings which are readily removed than underclothes. Patients suspecting lung trouble

frequently come to the physician wearing a chest protector, two or even three undershirts and other clothes. This is not only unnecessary, but probably harmful. The regulation clothes of the kind most comfortable to the patient meet all requirements.

Diet.— Nourishment is most important. If a patient is run down, and he usually is, it is absolutely necessary to build him up. This can be accomplished only by a proper amount of food. Some physicians of repute in tuberculosis advise a general mixed diet with the addition of two to four pints of milk daily. Some push the nourishment; others, like Bushnell, insist that it should not be forced. In regard to nutritive value foodstuffs stand in the following order: Milk, eggs, meat, vegetables, cereals. Contrary to popular opinion potatoes never made anyone fat. An ordinary good diet would be: Breakfast, 7:30 A.M., fruit, two boiled eggs, bread and butter and two glasses of milk; lunch, 9:45 A.M., one glass of milk; dinner, 12:30 P.M., soup, meat (preferably rare roast beef or beefsteak), three kinds of vegetables and a simple dessert, like ice cream or rice pudding; lunch, 3:30 P.M., one glass of milk; supper, 6 P.M., meat or eggs, potatoes or other vegetable, bread and butter and two glasses of milk. The diet found most generally suitable to the great majority of patients at the Sanatorium for Consumptives at White Haven, Pa., is as follows: Breakfast, 7:30 A.M., one and one-half pints of milk, with two raw eggs (the eggs may be broken up in the milk or taken whole) and fruit; lunch, 10 A.M., one pint of milk and one raw egg; dinner, 12:30 P.M., soup, meat, three or four kinds of vegetables and pudding or ice cream; lunch, 3:30 P.M., one pint of milk and one raw egg; supper, 6 P.M., one and one-half pints of milk, two raw eggs and fruit; lunch, 8 P.M. (just before retiring), one-half to one pint of milk. Alcohol (whisky, brandy, wine, etc.), which was at one time much lauded, especially by the laity, is now avoided by experts.

Climate.— Up to recently considerable dependence was placed on climate. Patients who could afford it were advised to betake themselves to the Southwest, and not infrequently those who could not afford it were told to "beat their way." It is still generally believed that a dry climate is more suitable for the cure of the majority of patients; yet no matter what the climate, the patient must carry out the foregoing or a similar line of treatment. It is to be remembered that tuberculosis is a disease of all climes and altitudes; that cases develop in Colorado and New Mexico as well as in Canada, and that cases have been and are being cured in all parts of the world. Some writers, among them many eminent in the specialty of tuberculosis, absolutely deny any influence to climate. This, however, may be affirmed with certainty: that if the removal to another climate entails, or is likely to entail, the least hardship or privation, it is better for the patient to remain at home. Moreover, if the patient is sent away he must be referred to another physician, or to a sanatorium, where he will have a physician's care. To send him away to meet his difficulties and emergencies by himself is an acknowledgment on the part of the physician that he does not know how to treat tuberculosis. Tuberculosis is, at least, as serious a disease as typhoid fever and requires analogous attention to detail. To send a tuberculous patient to a farmhouse or hotel in the country away from medical supervision is similar to instructing the family of a typhoid patient in the régime to be followed without returning to learn if the directions are carried out properly, or if new complications have taken place. In addition, in the hotel or boarding-house the patient is afraid to follow the régime too strictly, fearing that others will recognize his complaint, and he will be asked to leave. Moreover, to send a patient to a farmhouse where his disease is known has no further advantage. In this case the people have usually had tuberculous patients previously and have some ideas relative to the disease. These ideas are frequently wrong, yet wishing the patient well, they endeavor to instruct him. Any sick individual is more or less at the mercy of the well people about him; if they insist on certain things he has not the will-power to resist. He is, therefore, being treated by lay people not a physician.

Sanatoriums.— New sanatoriums for the treatment of tuberculosis are springing up almost every month. They are opening their doors as a result of private enterprise or benefaction or of a municipal crusade against the disease. They serve a three-fold purpose: (1) they gather in consumptives from large centres of population, and so prevent them from acting as a focus of contagion; (2) they instruct the patient how to take care of himself so that he is not a menace to others even when he returns home; (3) they demand a discipline which, if followed out, will in a favorable case cure. As a rule patients do better in sanatoriums than at home. There are a number of satisfactory sanatoriums throughout the United States, especially in the Northeast and Southwest quadrants.

Prevention in Cases of Chronic Tuberculosis of the Lungs.— The contagion is contained in the matter given off from a tuberculous sore. Therefore, in a case of tuberculosis of the lungs it is only necessary to destroy the sputum to prevent contagion to others. The patient should expectorate only into receptacles where the sputum can be properly handled without coming in contact with other things. He should never expectorate into rags or handkerchiefs, but should limit himself to spit-cup and paper napkins. The spit-cup should be made of paper so that it may be burned, or if of china should contain an antiseptic or germicide. Ordinary lye will suffice. The cup should be boiled daily. When coughing, the patient should hold a paper napkin before his mouth. There should be no question of anyone sleeping with the patient. Children are especially susceptible; hence, when the parents are tuberculous, extra care must be exercised. The sick room should be uncarpeted, have no curtains or hangings and contain only the bed, a table, washstand and the necessary two or three chairs. Window shades are permissible. The room should be as open to the sunlight as possible in order to keep up constant disinfection. The patient, however, should not be in the sun. The eating utensils (knives, forks, spoons, cups, saucers, plates and glasses) should

be separate and should be boiled after use. Food of any kind left over should be burned; it must not be given to others, or even to the domestic animals, the cow, dog, pig or cat. The patient's soiled clothes should be handled as little as possible. When a change of clothes, sheets, pillow-cases, wearing apparel takes place, the soiled pieces should be rolled up in a clean sheet and boiled without unrolling. They may then be washed in the usual manner. If the patient is walking about the house, every room that he occupies should be as open as possible. He should not be allowed to make the dining-room or the kitchen his living-room. Nobody should leave the patient's room without washing the hands immediately. Children should not be allowed in the sick-room. If the patient dies, the bed and furniture should be taken outside and washed. Bureau drawers should be scrubbed. The mattress should be sent to a steam-cleaning establishment, or at least the stains on it washed with soap and water. Following this the mattress and furniture should be exposed to the sunlight for at least three or four days. The floor and woodwork of the room should be scrubbed and the room opened as much as possible to the air and sunlight for a week. A good working rule for all infectious diseases is that everything which has come in contact with the patient should be burned or boiled; if neither is feasible, it should be thoroughly scrubbed and exposed to the sunlight.

Campaign against Tuberculosis.— This is one of the most important public health issues of the day, and through it we expect the eradication of the disease. During the last 40 years the death rate of tuberculosis has fallen 50 per cent, due, at least, partly to the public health efforts against it. The prospect is sufficiently bright that every State, municipality and individual should be interested. Every municipality should have hospitals for early and advanced cases, dispensaries for the treatment of the poor, an anti-tuberculosis society for the education of the public and open-air schools for tuberculous children. Anti-spitting laws should be made and enforced. Tuberculosis should be on the list of notifiable diseases. Tuberculosis in cattle should be under administrative control. The individual can aid by voluntary work in connection with a hospital or dispensary, by membership in the anti-tuberculosis society or by donation of funds for the work.

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In general it may be stated that the more the patient learns about tuberculosis the more he will understand the reasons for the directions of the physician and the more likely he is to carry them out. Every patient who can afford it, therefore, should join the National Tuberculosis Association (381 Fourth avenue, New York City), in order to receive the literature accompanying membership. In addition the following popular works are recommended: Flick, 'Crusade against Tuberculosis. Consumption a Curable and Preventable Disease. What a Layman should Know about it' (1903); Knopf, 'Pulmonary Tuberculosis: Its Modern Prophylaxis and the Treatment in Special Institutions and at Home' (1899); Brown, 'Rules for Recovery from Pulmonary Tuberculosis' (1916); Krause, 'Essays on Tuberculosis' (in *Journal of the Outdoor Life*, 1918–19); Carrington, 'Fresh Air and How to Use It' (1912), and 'Living and Sleeping in the Open Air' (1912); Minor, 'Hints and Helps for Tuberculous Patients'; Walsh, 'Onset of Tuberculosis' (in *Journal of the Outdoor Life*, August 1908), and 'Occupations for the Arrested Tuberculous' (in *Spunk*, August 1919); National Tuberculosis Association Standard Pamphlet, 'What you should know about Consumption' (1916); Otis, 'Tuberculosis, Its Cause, Cure and Prevention' (1918); King, 'The Battle with Tuberculosis and How to Win it' (1917); French, 'Home Care of Consumptives' (1916);

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TUBERCULOSIS, in cattle. See RINDERPEST.

TUBEROSE, tū'bē-rōs or tūb'rōz, an amaryllidaceous garden-flower (*Polianthes tuberosa*). The funnel-shaped perianth, an incurved tube, with somewhat rose-like lobes, often doubled in cultivation, has caused a misunderstanding as to the name, which properly refers to tuberous roots, but is generally pronounced as if it were "tube-rose." The flowers are creamy-white, waxen and brittle in texture, do not fade quickly, and are extremely fragrant, especially toward night. They are borne in a raceme at the top of a slender stem, from two to three feet tall. This stalk springs from a tuft of linear leaves, and is sheathed with the bases of others. The tube-rose is raised from bulbs, which are not hardy in the northern, but are grown for the trade very successfully in the southern, United States.

TUBES, Metal. See PIPE, MANUFACTURE OF.

TUBES, Pneumatic. See PNEUMATIC TUBES.

TUBES OF FORCE, imaginary tubular spaces in a field of force, and especially in a field of electric or magnetic force, whose bounding surfaces may be regarded as made up of lines of force. At any point in the surface of such a tube, the resultant force has a direction that is tangent to the tube. The conception is due to Faraday, and is very useful in forming a mental image of the physical state of a field of force. A tube of force cannot have a free end in any finite region of space. The tube must either return into itself, or pass off to an infinite distance, or terminate upon a mass of matter. The total number of lines of force included within a given tube of force is constant throughout the entire length of the tube; and hence it follows that the total force at all sections of the tube is the same; the intensity of a force varying inversely as the cross-section of the tube. In the case of an isolated electrified sphere, the tubes of electric force are radial cones, which converge, in external space, toward the centre of the sphere, but which terminate upon its surface. Also called "Tubes of Induction." See ELECTRICITY; MAGNETISM; INDUCTION.

TUBIGON, too-bē'gōn, Philippines, pueblo, province of Bohol; on the west coast; 24 miles northeast of Tagbilaran. It is on the coast highway. Pop. 15,860.

TÜBINGEN, tū'bĭng-ĕn, Germany, a town in Würtemberg, on the Neckar, 16 miles south of Stuttgart. The town stands in the midst of diversified scenery and is the seat of a national university. New buildings have been erected in connection with this flourishing institution, comprising various medical and physiological institutes. The university was founded in 1477. The library contains 250,000 volumes. There are a botanical garden and fine scientific museums and collections, and an observatory. Names of celebrities connected with the university are Melanchthon, Reuchlin and Baur. There is trade in agricultural produce, wine and fruits. Its chief history is connected with the 30 Years' War and the Reformation. Pop. 19,076.

TÜBINGEN SCHOOL, a name given to two separate and very different schools of philosophy, because their founders were connected with the famous University of Tübingen. The old school of Tübingen was orthodox. Gottlob Christian Storr, its founder (1746–1805), professor of philosophy at Tübingen in 1775, and professor of theology two years later, accepted without reserve the divine authority of the Scriptures, and defended miracles. Storr severely criticized Kant's book: 'Religion Within the Limits of Pure Reason,' and he set forth his own system in a work called 'Theory of Christian Doctrine Drawn from the Scriptures.' The later or modern school is that of Ferdinand Christian Baur (1792–1860), also professor of theology at Tübingen. Besides attacking the authenticity of certain of the Pauline epistles, he attempted to show that the fourth Gospel was not genuine. He admitted the morality of Christianity, but denied the miracles attributed to Christ and his apostles. Although Baur moderated his tone in later years his teachings promoted the spread of unbelief, and the 'Life of Jesus' by Strauss (1832), which attempted to show the Gospel to be a philosophic myth, was the outcome in a large degree of the critical studies of Baur. In 1915 there were 2,056 students and 128 instructors, but before the war the student body was much larger. Consult Pfleiderer, Otto, 'Development of Theology in Germany since Kant' (London 1890); Nash, H. S., 'The History of the Higher Criticism of the New Testament' (New York 1906); Moore, E. C., 'Outline of the History of Christian Thought since Kant' (1912).

TUBMAN, Harriet, negro abolitionist and philanthropist: b. in slavery about 1815; d. Auburn, N. Y., 10 March 1913. She escaped from her master's plantation in Maryland when about 25 years of age, visited Garrison Brown and other Abolitionists and became an active promoter of the "underground railway." She first rescued her parents and during the two decades before the Civil War made repeated journeys to the South and brought a total of 400 or more of her race to the North and into Canada. During the war she served with the Massachusetts troops as a scout and guided Colonel Montgomery in his memorable expedition into South Carolina. By the friendly help of Secretary Seward she was able to make her home in Auburn, N. Y., after the war, and there soon became engaged in philanthropic service in behalf of the poor and aged of her people. Her efforts led to the Foundation of the Harriet Tubman Home for Indigent Aged Negroes, to which she gave personal oversight until 1908. She married in the South in early life a man named Tubman, who died, and later married Nelson Davis.

TUBUAI, too-boo-ī, or **AUSTRAL ISLANDS,** Polynesia, a group of islands belong-

ing to France, and situated in the Pacific Ocean south of the Society Islands. Combined area, 111 square miles. They are fertile and produce tobacco, bananas and arrow-root. The population is estimated at 2,000, mostly native Polynesians.

TUBULAR BRIDGE. See BRIDGE.

TUBURAN, too-boo'rän, Philippines, pueblo, province of Cebu; on the west coast, on Tañon Strait, 30 miles northwest of Cebu. It is on the west coast highway, and is a place of considerable importance. Pop. 12,570.

TUCKAHOE, an Indian generic name, applied by the eastern Algonquins to all roundish roots. Specifically, it was the name of several Indian foods, as of the golden-club (*Orontium aquaticum*), and the arrow-arum (*Peltandra undulata*), both having deep and fleshy rootstocks, acrid when fresh, but rendered edible by cooking, and abounding in starch. Another tuckahoe was a subterranean fungus (*Dachyma cocos*), found very generally throughout the Southern States in light, loamy soils and growing on old roots, either as a saprophyte or a parasite. In form, size and cortex, it is not unlike a cocoanut, and is white and apparently structureless within, moist and yielding when first dug up, but becomes dry and cracked internally soon afterward. It is also called Indian-bread, Indian-head or Indian loaf, but is without starch, composed largely of pectose, is tasteless and insoluble in water.

TUCKAUBATCHEE, Battle of, in the War of 1812. On 18 Jan. 1814, after the battle of Autossee (q.v.), General Floyd left Fort Mitchell on the Chattahoochee and marched toward Tuckaubatchee, 40 miles south of Emuckfaw. His army consisted of 1,700 men, including 400 friendly Indians, while opposed to him were not more than 2,000 poorly armed warriors. By 27 January he had erected a fortified camp on Calibee Creek seven or eight miles south of Tuckaubatchee and there was unexpectedly attacked by the Indians, who drove in the sentinels and engaged in a fierce conflict within the lines. But the attack was finally repulsed with a loss to the Indians of 37 dead and many wounded while Floyd's loss was 22 killed and 147 wounded. The militia, having had enough Indian fighting, insisted on returning home, wherefore Floyd abandoned all his fortified posts and on 1 February reached the Chattahoochee. Consult Adams, 'The United States' (Vol. VII, pp. 249–250); 'American State Papers, Indian Affairs' (Vol. I, p. 858); Brackenridge, H. M., 'History of the Late War' (pp. 193–194).

TUCKER, tŭk'ẽr, **Abraham,** English philosopher: b. London, 2 Sept. 1705; d. Beckworth, Surrey, 20 Nov. 1774. He studied at Oxford, and later at the Inner Temple in preparation for the bar; but upon the death of his father he retired to his estate near Dorking. In 1754 he began to write his philosophical works, and nine years later published his first treatise, 'Free Will.' The first four of the seven volumes of his most celebrated work, 'The Light of Nature Pursued,' was published in 1768, and the last three posthumously.

TUCKER, Benjamin Ricketson, American anarchist: b. near New Bedford, Mass., 1854. He was educated at the Massachusetts Institute of Technology and in 1877 founded the *Radical Review* which was short lived. He then founded the journal called *Liberty* which in 1881 became one of the leading anarchist papers. Besides translations from leading anarchist writers he published 'State Socialism and Anarchism' (1899).

TUCKER, Charlotte Maria ("A. L. O. E.," that is, A Lady of England), English juvenile writer: b. Barnet, Hertfordshire, 8 May 1821; d. Amritsar, India, 2 Dec. 1893. She began her literary career in 1852 with the publication of 'Claremont Tales' and subsequently published more than 50 books besides numerous short stories. In 1875 she went to India where she engaged in missionary work until her death. Her books are chiefly of an allegorical character and are strongly religious in tone. The proceeds from their sale she devoted principally to her missionary work. Among them are 'Wings and Stings' (1853); 'Old Friends with New Faces' (1858); 'The Lost Jewel' (1868); 'Fairy Frisket' (1874); 'Pride and His Prisoners' (1882); 'Driven Into Exile' (1887); 'Harold's Bride' (1888), etc.

TUCKER, George, American author: b. Bermuda, 1775; d. Sherwood, Ala., 10 April 1861. After graduation at William and Mary College in 1797 he began the practice of law at Lynchburg, Va., and was a member of the State legislature for several years. He became representative in Congress (1819–25), and from that time on was professor of philosophy and political economy in the University of Virginia. He wrote much, including 'A History of the United States.'

TUCKER, Henry Saint George, American jurist: b. Williamsburg, Va., 29 Dec. 1780; d. Winchester, Va., 20 Aug. 1848. After his education at William and Mary College he studied law at Winchester (1802) and served as a private in the War of 1812. He was representative in Congress (1815–19), chancellor of the fourth judicial district (1824–31), judge of the Court of Appeals (1831–41) and professor of law at the University of Virginia (1844–45). He declined the appointment as United States Attorney-General by President Jackson. He published 'Lectures on Natural Law and Government' (1844).

TUCKER, Henry Saint George, American lawyer and scholar: b. Winchester, Va., 1853. He received his education at Washington and Lee University, and practised law at Staunton. He sat in the House of Representatives for eight years, and in 1897 succeeded his father, J. R. Tucker, as professor of constitutional and international law at Washington and Lee. Later he was a dean at what is now George Washington Universlty. He served a year as president of the American Bar Association (1904–05), a post held by his father in 1892–93. He wrote 'Tucker on the Constitution' (1899); 'Limitations on the Treaty-Making Power' (1915); 'Woman Suffrage by Constitutional Amendment' (1916).

TUCKER, John Randolph, American naval officer: b. Alexandria, Va., 31 Jan. 1812; d.

Petersburg, Va., 12 June 1883. He joined the navy in 1826, and during the Mexican War took part in several operations. He resigned in April 1861 and became a commander in the Confederate navy, taking part in the engagements in Hampton Roads, including the conflict between the *Monitor* and the *Merrimac*. He was prominent in the engagement at Drewry's Bluff, and was soon after promoted captain and sent to Charleston, S. C., to command the naval forces. After the fall of that city he went to Virginia and organized the naval brigade, which he commanded until the retreat of the Confederate army from Richmond. He received a commission as rear-admiral in the Peruvian navy in 1866 and directed the combined squadrons of Peru and Chile in their war with Spain. Being made president of the Peruvian hydrographic commission, he instituted explorations and surveys of the head waters of the Amazon.

TUCKER, Josiah, English clergyman: b. Laugharne, Wales, 1711; d. Gloucester, England, 4 Nov. 1799. He was graduated at Oxford, was ordained and appointed curate at Saint Stephens, Bristol (1737) and made rector in 1749. He became dean of Gloucester in 1758. He was noted for his views on the relations of the American colonies to the mother country, holding that separation would be no loss to the latter. His pamphlets on political economy anticipated some of the views of Adam Smith (q.v.). Among his notable utterances were 'The Elements of Commerce and Theory of Taxes' (Bristol 1753) and 'Reflections on Present Matters of Dispute between Great Britain and Ireland' (1775). Consult Clark, W. E., 'Josiah Tucker' (New York 1903).

TUCKER, Nathaniel Beverley, (I), usually known as Beverley Tucker, lawyer and son of Saint George Tucker: b. Williamsburg, Va., 6 Sept. 1784; d. Winchester, Va., 26 Aug. 1851. He was graduated from William and Mary College, Virginia, in 1801, studied law and practised in Virginia until his removal to Missouri in 1815. Here he was circuit judge until his return to Virginia in 1830. In 1834 he became professor of law at William and Mary College and served until his death, 17 years later. He was a prolific writer and has been pronounced the ablest man with his pen of that day in Virginia. Besides many political and miscellaneous essays published in magazines and periodicals, he wrote 'The Partisan Leader: a Tale of the Future' (1836); 'George Balcombe,' a novel (1836); 'Discourse on the Importance of Study of Political Science as a Branch of Academic Education in the United States' (1840); 'Discourse on the Dangers that Threaten the Free Institutions of the United States' (1841); 'Lectures intended to Prepare the Student for the Study of the Constitution of the United States' (1845); 'Principles of Pleading' (1846); and an unfinished life of John Randolph, his half-brother. 'The Partisan Leader,' a prophecy of Civil War between North and South, was reprinted in 1861 by the Republicans under the title 'A Key to the Disunion Conspiracy,' the object being to prove that the Southern leaders had long been planning secession and war.

TUCKER, St. George, American lawyer: b. Port Royal, Bermuda, 10 July 1752; d. Edgewood, Va., 10 Nov. 1827. He came to Virginia in 1771 as a student at William and Mary College, studied law, was admitted to the bar in 1774, and to practice in the general court the following year. He became interested at once in the revolting colonies and in 1781 was commissioned major in the Virginia forces. He was wounded at the battle of Guilford Courthouse and was promoted lieutenant-colonel. He became a delegate to the Annapolis Convention (1786) and professor of law in William and Mary College (1790–1804), after which he sat on the bench as judge for 37 years. He was the author of several poems and dissertations on topics of the day and an annotated edition of Blackstone.

TUCKER, Samuel, American naval officer: b. Marblehead, Mass., 1 Nov. 1747; d. Bremen, Me., 10 March 1833. He ran away to sea in boyhood, in 1768 commanded a merchant vessel plying between Boston and London, and on 17 May 1776 became a captain in the American navy. He settled at Bristol, Me., in 1792, and in 1812 captured a British vessel off the Maine Coast. He was a member of the Massachusetts legislature (1814–18), was one of the framers of the constitution of the new State of Maine (1819) and sat in the Maine legislature 1820–21. Consult Sheppard, 'Life of Commodore Tucker' (1868).

TUCKER, Thomas George, Australian critic and historian: b. Burnham, England, 29 March 1859. On graduation from Cambridge University he became professor of classical and comparative philology at Melbourne University in 1885. He is the author of many critical editions of Greek works. Among his other publications are 'Things Worth Thinking About' (1890); 'Life in Ancient Athens'; 'Life in the Roman World of Nero and Saint Paul'; 'Introduction to the Natural History of Language.'

TUCKER, William Jewett, American college president: b. Griswold, Conn., 13 July 1839. He was graduated at Dartmouth College in 1861, and after completing the course at Andover Theological Seminary, was ordained to the Congregational ministry in 1867, and installed as pastor of the Franklin Street Church, Manchester, N. H. In 1875 he became pastor of the Madison Square Presbyterian Church, New York. From 1880–93 he was Bartlett professor of homiletics at Andover, and from 1893 till his resignation in 1909 he was president of Dartmouth College. He is now president emeritus. His administration was marked by the enlargement and diversification of the curriculum, by the consolidation of the Chandler Scientific School with the College, and by the establishment of the Amos Tuck School of Administration and Finance. The growth of the college in numbers and resources during his administration changed its relative place among New England colleges. He has been Phi Beta Kappa orator at Harvard, Lyman Beecher lecturer at Yale, Morse lecturer at Union Seminary, New York, and lecturer at the Lowell Institute, Boston. He assisted in founding and editing the *Andover Review*, and established the Andover House in Boston, a social settlement, now known as the South End House. His published works include 'From Liberty to Unity' (1892); 'The Making and the Unmaking of the Preacher' (1899); 'Public-Minded-

ness' (1910); 'Personal Power' (1910); 'The Function of the Church in Modern Society' (1911). Since his retirement, on account of impaired health, in 1909, he has taken part in the discussion of public questions, chiefly through articles in the *Atlantic Monthly*. Among these are 'The New Reservation of Time' (Academic Pensions), 'The Progress of the Social Conscience,' 'The Goal of Equality,' 'The Ethical Challenge of the War,' 'The Crux of the Peace Problem.'

TUCKERMAN, tŭk'ẽr-măn, **Bayard,** American author: b. New York, 2 July 1855. He was graduated at Harvard in 1878, studied in Europe, and devoted himself to writing upon literary and historical subjects. He has also been lecturer on English literature at Princeton. His works include 'History of English Prose Fiction' (1882); 'Life of General Lafayette' (1889); 'Diary of Philip Hone' (1889); 'Peter Stuyvesant' (1893); 'William Jay and the Abolition of Slavery' (1893); and 'Philip Schuyler, Major-General in the American Revolution.'

TUCKERMAN, Edward, American botanist: b. Boston, 7 Dec. 1817; d. Amherst, Mass., 15 March 1886. He was graduated at Union College in 1837, and at the Harvard Law School in 1839. After a period of study in Europe he pursued another course at Harvard and later graduated from the Divinity School there. In 1854 he formed a connection with the faculty at Amherst College which lasted till the end of his life. In his earlier years his subject was history, but in 1858 he was transferred to the chair of botany, though he continued as a lecturer on history until 1873. He was the foremost authority in the United States on the subject of lichens. Tuckerman's Glen in the White Mountains was named in his honor. His scientific publications include 'Genera Lichenum: An Arrangement of the North American Lichens' (1872); 'A Catalogue of Plants growing without Cultivation within Thirty Miles of Amherst College' (1875); and 'A Synopsis of North American Lichens, Part I' (1882).

TUCKERMAN, Henry Theodore, American author and critic: b. Boston, 20 April 1813; d. New York, 17 Dec. 1871. He contributed very largely to periodicals, and his writings were at intervals collected. He was best informed on topics of art, and his 'Book of the Artists' is yet valuable for reference. His works include 'The Italian Sketch Book' (1835); 'Isabel; or, Sicily' (1839); 'Rambles and Reveries' (1841); 'Thoughts on the Poets' (1846); 'Artist Life' (1847); 'Characteristics of Literature' (1849–51); 'The Optimist' (1850); 'Poems' (1851); 'Memorial of Horatio Greenough' (1853); 'Bibliographical Essays' (1857); 'Art in America' (1858); 'The Book of the Artists' (1867); 'The Collector: Essays' (1868). He edited with William Smith 'A Smaller History of English and American Literature' (1870). Consult the addresses by Duyckwick (1872) and Bellows (1872).

TUCKERMAN, Joseph, American clergyman and philanthropist: b. Boston, Mass., 18 1778; d. Havana, Cuba, 20 April 1840. He graduated at Harvard in 1798 and was a Unitarian minister in 1801, with a charge at Chelsea, Mass. He there organized the first Seaman's Friend Society. In 1826 he removed to Boston where he successfully took charge of a large organization for co-operative charity. Going abroad, he assisted in the formation of similar work and his plans became a model in France. He was the author of several philanthropic publications. A memoir of his life was written by Channing in 1841.

TUCSON (from the pima *styuk-son,* "black or dark base," in allusion to a stratum in a mountain to the westward), Ariz., city, county-seat of Pima County, on the Santa Cruz River and the Southern Pacific, the El Paso and Southwestern, and other railroads, about 120 miles southeast of Phœnix and 150 miles from the Gulf of California, lat. 32° 14'; long. 110° 54'. Tucson is the largest city in the State of Arizona, and is a mining, agricultural and stock-raising region, and also gains great importance as a resort for those afflicted with pulmonary ailments. Its altitude is 2,390 feet, and owing to the dryness of the climate (the precipitation averaging less than 11 inches per annum) the summer heat is not oppressive, although the temperature frequently rises above 100°, while the climate in winter is delightful. The modern part of the city is well-built and paved and has numerous attractive residences, church edifices, public buildings, hotels and business houses; but the older part of the city bears the appearance of a typical adobe Mexican town of the 17th century. The chief industrial establishments are the shops of the Southern Pacific Railroad, but there are also flour mills, a fibre factory, ice factory, foundry, brick and tile plant, and lumber and stock yards. The Chamber of Commerce enumerates 35 establishments, employing 1,200 wage-earners and 125 salaried employees, and having invested a capital of $2,500,000. Wage-earners receive $1,279,000, and office employees $187,500. It has six excellent banks and two good daily newspapers. It is the seat of a Roman Catholic archbishopric, with a cathedral, and also of the University of Arizona (q.v.); it has a good public school system, several sectarian schools, a Presbyterian boarding school for Indians, and a library housed in a building erected by Andrew Carnegie at a cost of $25,000. Tucson contains a number of churches of various denominations, a Roman Catholic hospital and numerous tuberculosis sanatoria. A Desert Botanical Laboratory has recently been established in the vicinity under the auspices of the Carnegie Institution of Washington.

When first known to history Tucson was a rancheria of mixed Papago, Pima and Sobaipuri Indians, the missionary at San Xavier del Bac, nine miles down the Rio Santa Cruz, beginning to visit it for the purpose of converting the natives in 1763. In 1776 the Spanish presidio at Tubac was removed to Tucson, when it became known as the Presidio de San Augustin del Tuguison. In the early days the surrounding country was overrun and its inhabitants harassed by the Apaches. In September 1848 its population was 760; before the close of the year it was considerably augmented by refugees from Tubac and Tucumcari, who had been driven out by the Apaches, but by 1852 the number of inhabitants had dwindled to 300 or 400. Being within the limits of Gadsden

Purchase (q.v.), Tucson was garrisoned in 1856 by the First dragoons, and on August 29 of that year a convention was held to take measures for a territorial organization of Arizona. From February to May 1862, the city was occupied by Confederate troops, in 1867 the capital was changed from Prescott to Tucson, where it remained until 1877, when it was transferred back to Prescott. (See ARIZONA). The city was incorporated in 1877 and reincorporated in 1883, and adopted a new form of government with a manager in 1915. Pop. 27,553.

TUCUMAN, too-koo-măn', Argentina, the capital of the province of Tucuman, in the northern part of the country, situated near the eastern base of the Andes, on the river Tala, 300 miles northwest of Cordoba. It has a delightful climate, is surrounded by orange groves and sugar plantations, and has a university, a fine cathedral, a large hospital, libraries and a theatre, excellent banking facilities and good newspapers. The chief industrial establishments are sugar factories, distilleries and tanneries. It is an old city, founded by the Spanish in 1565. During recent years it has grown very rapidly, becoming a centre for several railroad lines to Santa Fé, Rosario, Buenos Aires, Córdoba and Salta, and is the principal trade centre of northern Argentina. The area of the province is 10,422 square miles, the population about 333,000; of the city 100,080.

TUCUMCARI, N. Mex., city and county-seat of Quay County, on the Chicago, Rock Island and Pacific and the El Paso and South Western railroads, about 350 miles southwest of Denver. It has a government experiment farm and a city library and is a distributing point for coal. It is interested in cattle raising, wheat and corn growing and the manufacture of sisal. Pop. about 3,000.

TUDOR, tū'dor, one of the royal families of England, having a representative on the throne from 1485 to 1603. The line began with Henry Tudor, Earl of Richmond, the grandson of Sir Owen Tudor, a Welsh knight of distinction, who, after the battle of Bosworth Field, was proclaimed king with the title of Henry VII (q.v.), from him the crown descended to his son, Henry VIII, whose son, Edward VI (q.v.), succeeded, and after him his two sisters, Mary (q.v.) and Elizabeth (q.v.). See also GREAT BRITAIN — THE REFORMATION IN ENGLAND.

TUDOR, William, American author: b. Boston, 28 Jan. 1779; d. Rio Janeiro, Brazil, 9 March 1830. He was graduated from Harvard in 1796 and entered the counting-room of John Codman, in whose employ he visited Paris. He afterward made a tour to Italy and the Continent, and on his return engaged in founding the "Anthology Club." In 1815 the first number of the *North American Review* appeared under his editorship, and three-fourths of the first four volumes were written by him. In 1819 he published 'Letters on the Eastern States,' in 1821 'Miscellanies' and in 1823 'Life of James Otis.' In 1823 he was appointed American consul at Lima, and in 1828 made chargé-d'affaires at Rio Janeiro, where he wrote a work published anonymously under the title 'Gebel Teir' (1829). He was one of the founders of the Boston Athenæum, and to him the country is indebted for the first suggestion of Bunker Hill monument.

TUDOR ARCHITECTURE, late Perpendicular work in England. There are three phases of this style of architecture: (1) The Early Tudor, from the reign of Edward IV to Henry VII, inclusive. Of this style there are no perfect buildings and only few traces remaining. The Palace of Shene, built by Henry VII, has totally disappeared; but, according to the Survey of 1649, it abounded with bay windows of capricious design, with rectangular and semi-circular projections, and was adorned with many octagonal towers, surmounted with bulbous cupolas of the same plan, having their angles enriched with crockets. (2) Tudor, in vogue during the reign of Henry VIII. The plan of the larger mansions of this period was quadrangular, comprising an inner and base court, between which stood the gate house. On the side of the inner court facing the entrance were the great chamber, or room of assembly, the hall, the chapel, the gallery for amusements, on an upper story, running the whole length of the principal side of the quadrangle, and the summer and winter parlors. The materials were either brick or stone, sometimes both combined. Molded brickwork and terra-cotta were also employed for decorative purposes. Among the more striking peculiarities were the gate houses, the numerous turrets and ornamental chimneys, the large and beautiful bay and oriel windows, hammer beam roofs and paneled wainscoting round the apartments. (3) Late Tudor, or Elizabethan, as seen in many country houses.

TUESDAY, the third day of the week, so called from the Anglo-Saxon god of war, Tiu, or Tiw. See TYR.

TUFA, a name applied to the cellular deposits from mineral springs. These are either silicious or calcareous. The former are classified under silicious sinter, the latter are called calc tufa or calc sinter. Calc tufa is a cellular variety of calcite in which the mineral matter has been deposited from the waters of springs around nuclei of leaves, twigs, mosses, etc. Many older writers extended the term to include "tuff," a usage not sanctioned at present.

TUFF, a name properly applied only to finely divided particles ejected from volcanoes by explosive eruptions, and only so called after partial or complete compacting. The most notable illustration is the volcanic ash which buried Pompeii. The term is not to be confused with "tufa" (q.v.).

TUFTS, James Hayden, American educator: b. Monson, Mass., 9 July 1862. He was graduated at Amherst in 1884 and at Yale in 1889 and took his Ph.D. at Freiburg in 1892. He was instructor in mathematics in Amherst (1885–87), in philosophy at the University of Michigan (1889–91) and in 1900 became head of the department. He also served as dean of the Sanior College (1904 and 1907–08), University of Chicago. He is the author of various monographs on philosophical subjects and became editor of the *International Journal of Ethics* (1914).

TUFTS COLLEGE, located at Tufts College Station near Medford, Mass. It was chartered in 1852 and first opened to students

in 1854; though established by members of the Universalist Church, it is non-sectarian in its policy and control. A notable feature of the first curriculum of the college was the special attention given to history; the policy has always been most liberal, and the courses have been constantly increased in number and broadened in scope in response to the tendencies of the modern educational development. Civil engineering courses were begun as early as 1869; and courses in other engineering departments added later; the first professional school was the Divinity School established in 1882; the Medical School was added in 1893, and the Dental College in 1899. All departments were open to women in 1892. In 1910 Jackson College for Women was opened as a department of Tufts College. The college organization now includes the following departments: (1) the School of Liberal Arts; (2) the Engineering School; (3) Jackson College for Women; (4) the Graduate School; (5) the Crane Theological School; (6) the two-year Pre-Medical School; (7) the Medical School; (8) the Dental School. The degrees conferred are A.B. and B.S. in the School of Liberal Arts, Engineering and Mechanics, and A.M. for graduate work. The courses leading to the degree of A.B. are largely elective, requirements being by groups, instead of by special subjects, and each group except English and physical training including electives; the science and engineering courses are more specialized in character, and include only a few electives. Shop work is included in the engineering course. The Bromfield-Pearson School is designed to furnish instruction for those who are deficient in some of the studies required for entrance to the engineering courses, but fitted to pursue the college courses in certain subjects. The Crane Theological School offers a four years' course leading to the degree of S.T.B.; in 1902 an arrangement was made by which the A.B. course could be combined with the theological course in such a way that both degrees could be obtained in five years. The Medical School offers a four years' course leading to the degree of M.D.; the Dental School confers the degree of doctor of dental medicine at the satisfactory completion of a four years' course. These two schools are located at Boston, occupying a large well-equipped building completed in 1902. An additional building for the Medical School was completed in 1917.

There are 82 scholarships and four special scholarships provided in the collegiate department and 12 in the Crane Theological School. The government of the college is vested in a board of 30 trustees, 20 of whom are self-perpetuating; to give the alumni as a body a representation in the college administration, 10 of the trustees are elected by the alumni, two each year for terms of five years. Alumni members of the board of trustees have the same power as the self-perpetuating members of the board. On the college campus there are (1918) 21 buildings; these are Ballou Hall, the Barnum Museum (built and endowed by P. T. Barnum), the Goddard Chapel, the Goddard Gymnasium, the Eaton Library, Packard Hall (occupied by the Crane Theological School), the chemical building, the Bromfield-Pearson School (containing the engineering shops), Robinson Hall, Miner Hall (occupied by Jackson College for Women) and Paige Hall, four dormitories for men, East Hall, West Hall, Dean Hall and Curtis Hall, five for women, Metcalf Hall, Start House, Richardson House, Gamma House and Knight House, and the power house. The general library in 1918 contained 74,000 volumes; in addition there are several special libraries, including the Universalist Historical Society collection (in Packard Hall), 6,000 volumes; the library of natural history (in the Barnum Museum), 2,500 volumes; the Metcalf musical library (in the Goddard Gymnasium), 1,600 volumes. The Medical and Dental schools also have libraries in their building in Boston, and students in these schools have access to the Boston Public Library. The productive funds in 1918 amounted to $2,256,000; the students numbered 1,645; the faculty numbered 255.

TUG-OF-WAR, a sport in which a number of persons divide into two parties; a line is marked out on the ground, and the two parties, laying hold of either end of a stout rope, try to drag each other across the line.

TUGBOAT, a small steam-vessel, having very large engines of great horse power and very little storage capacity, used for towing large vessels in and out of harbors, and in rivers and canals. More than 1,000 of these are employed in New York Harbor alone and are classed by boatmen under various names. Tugs are also of great service in forcing a channel through the ice; in rescue work if there is a wreck or a ship on fire; in transporting car floats for the railroad companies and in towing great rafts of logs.

TUGENDBUND, too'gĕnt-boont (German for "league of virtue"), a union ostensibly for the promotion of educational and social reforms, which was organized in Prussia in 1808, the real purpose being to free North Germany from the intolerable yoke of Napoleon. The Prussian government was apprehensive that the Tugendbund might involve it in further difficulty with the French emperor, then virtually master of Germany, and suppressed the movement in 1809.

TUGUEGARAO, too-gā-gä-rä'ō, Philippines, pueblo, capital of the province of Cagayán, Luzon, within a few miles of the Grande de Cagayán River, 215 miles north of Manila. It is on the main highway to Manila and is the centre of a fertile agricultural region. It is well built, many of the houses being of stone; it has a large public square, a church, courthouse and town-hall. Pop. 16,820.

TUILERIES, twē'lë-rĭz (Fr. twēl-rē, named from the "tile-works," which originally occupied the site), previous to 1871 the royal and imperial palace at Paris, situated almost in the centre of the city on the north bank of the Seine. It was founded in 1564 by Catherine de Médici, wife of Henry II. Later monarchs extended it and altered the plans, until it became a large, complex structure, but with little architectural interest. It was stormed and sacked by the Paris mob in each of the revolutions, but was restored, and served as the residence of all the monarchs of the 19th century, including the two emperors. In 1871 it was set on fire by the Communists, and al-

most totally destroyed. Only the two eastern wings connected with the Louvre remain. The rest of the site has been converted into a public garden. See PARIS.

TUKE, tūk, **Daniel Hack,** English physician: b. York, 19 April 1827; d. London, 5 March 1895. He studied at Saint Bartholomew's Hospital College, London, and was graduated from the University of Heidelberg in 1853. He afterward made extensive tours on the Continent, visiting the principal asylums for the insane and recording his observations, a practice he continued throughout his life. Upon his return from his first tour abroad he became visiting physician to the York Retreat for the Insane, but was compelled to retire in 1859 because of failing health. In 1875 he removed to London and until his death was engaged as consulting physician in mental diseases. He was associate editor of *The Journal of Mental Science* in 1878–92, collaborated with J. C. Bucknill in writing 'A Manual of Pyschological Medicine' (1857), and also wrote 'Illustrations of the Influence of the Mind on the Body' (1872); 'Insanity in Ancient and Modern Life' (1878); 'History of the Insane in the British Isles' (1882); 'Dictionary of Psychological Medicine' (1892), etc.

TUKE, Henry Scott, English writer and religionist: b. York, 1756; d. there, 1814. He was a distinguished minister of the Society of Friends and wrote several works which are considered standard authorities in that denomination. Among them are 'The Faith of the People called Quakers in our Lord and Saviour Jesus Christ, set forth in Various Extracts from their Writings' (1801); 'The Principles of Religion as Professed by the Society of Christians usually called Quakers, Written for the Instruction of their Youth and for the Information of Strangers' (1805), and 'Biographical Notices of Members of the Society of Friends' (1813).

TUKE, William, English philanthropist: b. York, 24 March 1732; d. there, 6 Dec. 1822. He was devoted to mercantile pursuits, principally in the tea and coffee trade. Belonging to the Society of Friends, his attention was called, through the death of a fellow-believer confined in the York County Asylum, to the necessity of ameliorating the condition of the insane. With his son Henry, Lindley Murray and other Friends he secured funds for the opening of the York Retreat in 1796. In this institution began in England the modern humane methods of treatment, a reform that, unknown to Tuke, Pinel was carrying out contemporaneously in Paris. Inmates were no longer kept in chains; restraint and irksome discipline were removed; quiet surroundings with some industrial occupation were provided. After his death important legislation on the treatment of the insane was the direct result of his reforms.

TUKUARIKA, too'kwä-rē'kä. See SHOSHONEAN INDIANS.

TULA, too'lä, Mexico, a town in the state of Hidalgo, situated on the railroad, 40 miles west of Pechuca, at an elevation of 6,750 feet. It has a church and convent built by the early Spanish settlers, and in the neighborhood are extensive ruins supposed to be remains of the old Toltec capital. Cotton is manufactured. Pop. 5,000.

TULA, Russia, (1) capital of Tula, on the Upa, 120 miles by rail south of Moscow. It is an important manufacturing place, has churches, museum, arsenal and government offices, and an ancient Kreml. Its industrial works include a large gun factory, sugar refinery, dye-works, factories for bicycles, small arms, samovars, harmoniums, bells and mathematical instruments, besides manufactures of soap, candles, sealing wax, etc. Pop. 140,620.

(2) Tula, is a government of central Russia, whose area comprises 11,954 square miles. Its surface is mostly flat, and almost everywhere capable of cultivation. There are extensive forests, and the principal streams are the Oka, Upa and Don. Canals connect the region with the Baltic, Black and Caspian seas. Agriculture and stock raising are important. Iron is extensively manufactured. Pop. 2,016,000.

TULALIP. See SALISHAN INDIANS.

TULANE, tū'lān', **Paul,** American philanthropist: b. Princeton, N. J., 6 May 1801; d. there, 27 May 1887. He came of a distinguished family of French jurists, the probate judgeship of Tours having been in the Tulane family for 150 years. His father, Louis Tulane, came to America about 1795 and settled on a farm near Princeton, N. J., where his family lived for many years. Paul's early education was limited to a common school training, and he worked on the farm and, later, assisted in keeping a small grocery. About 1819 he went to New Orleans, settled there, and with the aid of a French cousin, then in America, opened a general merchandize store in 1822. By 1828 he had amassed a fortune of $170,000, a large amount at that time. He continued in a prosperous mercantile career until 1858, when he retired from active business, purchased a residence in Princeton and divided his time between it and New Orleans for many years, continually increasing his property both in the Crescent City and at the North until his death. His interest in education appears to have been first awakened during the trip with his cousin in 1819 on observing several young Creoles from New Orleans on their way to Transylvania University, in Kentucky. He seems then to have been struck with the fact of the lack of educational advantages for these young people at their home. This interest bore fruit in the fact that, entirely without solicitation, he formed in 1882 a group of friends into a body which incorporated itself as "The Board of Administrators of the Tulane Education Fund." To them he gave in trust a considerable property, without specific instructions except that the fund donated was "for the promotion and encouragement of intellectual, moral and industrial education among the white young people in the city of New Orleans, State of Louisiana." By contract with the State, securing thereby exemption from taxation on its property, the board thus formed took over the University of Louisiana, founded in 1832, the name of which was then changed to Tulane University of Louisiana (q.v.). His first gift for educational purposes in New Orleans consisted of his New Orleans real estate, valued at about $363,000. By subsequent gifts his endowment was raised to a total of $1,100,000.

TULANE UNIVERSITY OF LOUISIANA, located in New Orleans. This institution, under its present name, was created by Act No. 43 of the legislature of 1884. Its oldest department is the Medical College, which was organized as a private enterprise in 1834, and which was the first medical college in the Southwest. In 1845 the first Democratic Constitutional Convention that assembled in the State provided for the establishment of an institution to be known as the University of Louisiana, which should embrace as one of its departments the medical college already in existence, together with a department of law, a department of natural sciences and of letters. The State refused to bind itself to support the new university, but in the years following the legislature appropriated about $100,000 for the equipment of the medical department and for a building to house it. The plans of the convention for the other departments were not realized until 1847. The first meeting of the board of administrators took place 27 April 1847. On 4 May of the same year the board decided that law lectures should begin the following November. On 1 June 1847 a committee was appointed to report on the organization of a department of letters and natural sciences. The first president of the university, elected 21 July 1847, was Dr. Francis Lister Hawks of North Carolina. The academic department existed only as a high school until 1851, when the college proper was opened with 12 freshmen and two sophomores. The medical college was the most successful department down to 1861, when the Civil War closed the university. At the close of the conflict the law and medical colleges were reopened, but the reopening of the academic department was delayed. In November 1878 the academic department was revived under Dean Richard H. Jesse. Beginning in 1879, the State made an appropriation of $10,000 a year for its support, the first regular appropriation it had ever received. Private munificence, however, was now to take the place of State appropriations. In 1882 Paul Tulane, a former merchant of New Orleans, made a large donation for the higher education of "the white young persons" in the city of New Orleans. This donation was augmented until it amounted to more than a million dollars. The acceptance of this gift was followed by the absorption of the old University of Louisiana, which was effected by Act 43 of the general assembly of 1884, and which has been ratified by the present constitution (1898). As a *quasi*-State institution the university is exempted from all taxation on its property, and in recognition thereof it remits all claim to the appropriation of $10,000 and gives a free scholarship to every legislative and senatorial district in the State. To the presidency of Tulane University of Louisiana the board called a distinguished soldier and scholar, Col. Wm. Preston Johnston, who labored until his death in 1899 to enlarge the usefulness of the institution. He was succeeded in 1900 by Dr. Edwin A. Alderman, who, in turn, was succeeded in 1905 by Dr. E. B. Craighead, in 1912 by Dr. Robert Sharp and in 1918 by Dr. Albert B. Dinwiddie. In 1886 Mrs. Josephine Louise Newcomb donated $100,000 to the Tulane University of Louisiana, for the higher education of white girls and young women. This endowment, to which Mrs. Newcomb added more than $2,000,000 during her life and in her will, has enabled the administrators of the university to offer to women the advantages formerly given only to men. In 1891 Mrs. Ida G. Richardson presented the medical department with a splendid modern building, equipped with every needed appliance for instruction in medicine. In the year 1894 the undergraduate departments were moved from the old contracted quarters (on Dryades street, near Canal), to a splendid site on Saint Charles avenue, opposite to Audubon Park in the best residential section of the city, and in 1918 Newcomb College was removed to its new site, adjoining the Tulane campus. In 1900 Mrs. Caroline S. Tilton gave to the university the present beautiful library building and in 1906 made an additional donation for the erection of the annex to the library. In 1902 Mr. Alex. C. Hutchinson bequeathed the sum of $800,000 to the university for the benefit of the medical department. The Richardson Memorial, on Canal street, was transferred to the Hutchinson Fund, and the proceeds of this transfer used for the erection on the campus of the Richardson Memorial Building, the enlargement of the Chemistry Building, which was renamed the Richardson Memorial Chemistry Building, and the Richardson Memorial Dormitory for medical students. In 1906 the New Orleans Polyclinic was acquired by the university, and is now the Graduate School of Medicine and in 1909 the New Orleans College of Dentistry became the School of Dentistry. In 1910 Mr. F. W. Callender bequeathed the sum of $65,000 to the university, which sum was set apart as a foundation for the establishment of the F. W. Callender Laboratory of Psychology and Education. In 1910 Mr. Stanley O. Thomas bequeathed the sum of $60,000 for the erection of a building to be known as Stanley Thomas Hall. As presently constituted the university comprehends the following colleges and schools: College of Arts and Sciences, College of Technology, H. Sophie Newcomb Memorial College for Women, Faculty of Graduate Studies, College of Law, College of Medicine (including School of Medicine, Graduate School of Medicine, School of Dentistry and School of Pharmacy) and the College of Commerce and Business Administration.

TULARE, Cal., city in Tulare County, on the Southern Pacific and the Atchison, Topeka and Santa Fé railroads, about 45 miles southeast of Fresno. It has an important trade in fruits and cereals and dairy products. There is a public library. Pop. about 3,000.

TULÉ, too'lĕ, the Spanish-American name of a variety of the bulrushes, *Scirpus lacustris* and *S. tatora,* so common in the overflowed lands of the southwestern United States that those districts are called tulé lands. *S. lacustris* is a tall, large, smooth-stemmed rush with an umbel of flower spikelets, and with the leaves reduced to mere sheaths. It has a thick, fleshy, perennial rootstock, eaten by the aborigines, and which when sun-dried and powdered is said to keep well, and to be of good taste. Tulé seeds, also, are eaten; and the stems are woven into mats and baskets, and, like reeds, are used in great bunches to form the curious craft called balsas.

TULIP, a genus of bulbous herbs of the family *Liliaceæ*. The species, of which about 100 have been described and 40 introduced into cultivation, are natives of temperate Asia, and some have become naturalized in the Mediterranean region of Europe. They are characterized by tunicated bulbs, linear or broad radical leaves from the base of which rises the scape three inches to two feet or more tall and bearing at its summit usually a solitary bell-shaped flower, sometimes two, three or even four. These flowers are large, brilliant and showy, single or double, generally erect but sometimes nodding. Their colors are red, yellow, white and variegated in a great variety of tints and markings.

For more than three centuries the tulip has been popular in European gardens and prior to this period it was cultivated by the Turks for many centuries. In 1753 Linnæus grouped the garden tulips under the botanical name *Tulipa gesneriana*, which has since been erroneously cited as that of the original species. Another form (*T. suaveolens*) was named in 1797. It was well known in southern Europe prior to this date, but seems to have been an escape and was formerly distinguished from other tulips then cultivated by its earlier bloom, larger size, pubescent scape and fragrant flowers. Hence the conclusion that the earlier garden varieties are probably derived from the latter species and the later ones probably from the former.

Interest in the tulip began in Vienna in 1554, when Busbequis, an Ambassador to Turkey, procured seeds from a garden near Constantinople. From that time forward the popularity of the plant increased rapidly. In 1591 specimens of Clusius' varieties stimulated interest in the plant in Holland, where the production of new varieties increased rapidly until it became a craze in 1634. From that date until 1637 the wildest speculation prevailed. Not only were enormous prices paid for individual bulbs, 13,000 florins (about $5,200) for a bulb of the variety *Semper Augustus*, but ownership was divided into shares, and many of the schemes known to the stock and bond market were in vogue, often without the existence of any bulbs at all. The government had at last to interfere but this was not until many families had been impoverished or even ruined financially. Since that time the popularity of the plant declined, but later reached the normal basis upon which it now rests, with its headquarters in Holland and Belgium. During the closing decade of the 19th century experimenters in the State of Washington have produced superior tulip and other bulbs, and will probably supply the American market.

The garden tulips are divided into four principal groups: selfs, in which the flowers are of only one color; roses, in which the petals show varying shades of red, scarlet and pink; bizarres, in which the petals have yellow bases or centres and are bordered more or less widely with orange, red, etc.; and bybloemens, dark-colored flowers — purple, maroon, brown, black, etc. In these various classes about 2,000 varieties are listed by the European bulb growers, and they are further divided into singles and doubles, and except the selfs are segregated into feathered and flamed, according as the colors are intermingled in narrow or broad stripes.

One of the most remarkable phenomena about tulips grown from seed is that after the plants began to produce blossoms for one or several years they «break»; that is, the colors and markings of the flowers change radically. A single-flowered self may become a double-flowered bizarre or rose, perhaps even showing no traces of the original tint. Owing to the length of time required to produce flowering bulbs from seed — three to seven years — this method of propagation is rarely practised except by originators of new varieties and by growers who supply small bulbs to fanciers and others. Named varieties are all propagated asexually, generally by offset bulbs which are usually produced freely. These do not «break» unless the progeny is obtained prior to the «breaking» of the parent bulb.

Tulip will grow in almost any garden soil, but will thrive best in well-drained friable loam of moderate texture and richness. The bulbs should be planted in mid-autumn four inches below the surface. During the winter, in the North they may be mulched with litter, evergreen boughs, etc., to keep the frost in the soil and prevent alternate freezing and thawing. In spring when the weather has become somewhat settled the mulch should be removed and the surface smoothed with a rake. After blossoming the leaves should be allowed to turn yellow before the plants are dug, if they are to be dug, in order to allow them to elaborate food for the next season's bloom. If desired they may be left in the ground for two or three years. When taken up they should be cleaned, the offsets removed, dried in the shade and stored in a cool dry place until planting time. For house and greenhouse use, the bulbs may be planted in flats or pots as soon as received from the seedmen, kept in a dark place until the roots are well produced and the tops begin to show; then they may be taken to a temperate room and gradually inured to both light and heat. After they have produced their blossoms they are usually thrown away because a fresh supply can be obtained so cheaply that the care usually required to «bring them around» again is considered wasted. However, they are sometimes planted in odd corners of gardens where some specimens will usually recover from the effects of the forcing. Consult Bailey, 'Standard Cyclopedia of Horticulture' (New York 1916); Solms-Laubach, 'Weizen und Tulpe und deren Geschichte' (Leipzig 1899).

TULIP-TREE, one of the handsomest and largest deciduous trees (*Liriodendron tulipifera*) in America, attaining its greatest dimensions in the Middle States, in deep, moist, loamy soils. It is remarkable for its absolutely straight, massive trunk, sometimes tapering from a base, 20 to 25 feet in girth, to a height of 150 feet. The bark is regularly ridged, but is of fine texture and ashen-hued. That of saplings is very smooth, grayish-green and mottled with gray. A tree grown in the open is of a symmetrical, pyramidal or spindle-like outline, with many diverging and upward sweeping branches. The foliage is very glossy and bright green, the leaves peculiar in form,

being nearly square, and three-lobed, the lateral lobes rounded at the base, the central one having a broadly-triangular notch taken out of its apex. They turn to a clear yellow in autumn, and the leaves, trembling on long petioles, have caused this tree to be confounded with the poplars, in popular nomenclature. When very young, the blade is bent down against its stem and is covered by two membranous boat-shaped stipules, which unite about the bud and do not separate and fall away until the tender leaf is able to endure the weather.

The tulip-tree is one of the magnolia family, and in June is covered with handsome flowers, which have suggested the generic name, meaning "lily-tree"; but the vernacular term seems more apt, since the six petals have the flaring, cup shape of the tulip. They are solitary, terminating the branchlets, and are yellowish-green outside, lined with orange, with a suggestion of a green star at the base. A ring of stamens stands inside, surrounding the column of carpels. The fruits persisting long after the leaves have fallen, are like long samaras, hung by slender stalks, on the cone-shaped receptacle, and overlap it like inverted shingles. During the winter they are torn away and drift hither and thither.

The heartwood is classed among light woods, is easily worked, has a compact fine grain, and takes a high polish; when perfectly seasoned, it is durable and resists insects' attacks, but is likely to warp and shrink if not well dried. The color may be either white or yellow, and the wood is known as white or yellow poplar, the latter variety being the better. At one time used greatly for house-building, furniture, wooden utensils and many other purposes, on account of its lightness and strength, it is also valuable for carriage panels. Indians were said to have wrought it into long canoes, so regular and light were the trunks. An infusion of the bark when added to an equal quality of dogwood is reckoned as a remedy for intermittent fevers, when alone as a substitute for cinchona and as a gentle cathartic. Many fossil species have been found, representatives of the *Liriodendron* type, of which it alone survives.

TULL, Jethro, English agriculturist: b. Basildon, Berkshire, 1674; d. near Hungerford, Berkshire, 21 Feb. 1741. He was educated at Oxford, and was called to the bar in 1699. He appears to have had political ambitions, but ill health compelled their abandonment and after an extended tour of Europe he settled on his estate and devoted himself to agriculture. In 1809 he removed to his farm near Hungerford which he christened "Prosperous Farm" and continued his experiments. He introduced the system of planting in rows and pulverizing the soil between them, but made the serious mistake of considering the finely pulverized earth and moisture sufficient for the growth of the plants and dispensed with fertilizing the soil, a system which involved him in serious losses. He invented the drill-plow and published 'New Horse-Hoeing Husbandry' (1733), a work which was long an authority in England.

TULLAHOMA, Tenn., city in Coffee County, on the Nashville, Chattanooga and Saint Louis Railroad, about 69 miles southeast of Nashville. It contains the Chautauqua grounds, the Pythian Home, the Fitzgerald and Clarke Preparatory School, the State Vocational School for Girls, the Cumberland, Pylant and Hurricane Springs. Its manufactures include buggies, golf sticks, overalls and tobacco products. Pop. about 4,000.

TULLAHOMA, tŭl-ą-hō'ma, or **MIDDLE TENNESSEE, CAMPAIGN.** When General Bragg after the battle of Stone River or Murfreesboro (q.v.) fell back from Murfreesboro he designed to hold the line of Elk River, but was directed to hold that of Duck River, north of which he disposed his forces; his infantry front extending from Wartrace on the right to Shelbyville on the left, with cavalry on the right at McMinnville and on the left at Columbia and Spring Hill. Polk's corps, on the left, held Shelbyville, which was well fortified, and a strong detachment was thrown forward about 10 miles to Guy's Gap. The greater part of Hardee's corps held Hoovel's, Liberty and Bell Buckle gaps, and part of it was at Tullahoma, 36 miles south of Murfreesboro, which was fortified and held as a depot of supplies. Bragg's position was covered by a range of high, rough, rocky hills, the principal routes passing southward from Murfreesboro toward Tullahoma and the line of his communications with Chattanooga, being the Manchester road through Hoover's Gap, the Wartrace road through Liberty and Bell Buckle gaps and the Shelbyville road through Guy's Gap, all of which were strongly held. His cavalry, under Generals Wheeler and Forrest, was very active, attacking posts and detachments in Rosecrans' rear and on his flanks, breaking railroads and capturing wagon trains and in every manner harassing him, and to prevent which Rosecrans was but feebly prepared, having a much inferior cavalry force in point of numbers.

Early in January 1863, the troops of the Army of the Cumberland, under General Rosecrans, were organized into three army corps, designated the 14th, 20th and 21st, commanded respectively by Gens. Geo. H. Thomas, A. McD. McCook and T. L. Crittenden. There was a reserve corps, under Gen. Gordon Granger, and a cavalry corps, commanded by Gen. D. S. Stanley. There were in the early months of 1863 many reconnaissances, which brought on several severe engagements. and the cavalry was kept busy by Wheeler and Forrest. Rosecrans was pushing his preparations for an active campaign and keeping up a fruitless appeal to the authorities at Washington for an increase of his cavalry force. By the middle of June he had decided upon a campaign to drive Bragg from middle Tennessee and fully informed that he was strongly intrenched at Shelbyville and Tullahoma determined to render these intrenchments useless by turning Bragg's right and moving on the bridge across Elk River in his rear, thus compelling his retreat or to give battle on open ground. He says: "To accomplish this it was necessary to make Bragg believe we could advance on him by the Shelbyville route, and to keep up the impression, if possible, until we had reached Manchester with the main body of the army. . . . The plan was, therefore, to move General Granger's command to Triune, and thus create the impression of our intention to advance on them by the Shelbyville and

Triune pikes, while cavalry movements and an infantry advance toward Woodbury would seem to be feints designed by us to deceive Bragg and conceal our supposed real designs on their left, where the topography and the roads presented comparatively slight obstacles and afforded great facilities for moving in force." Rosecrans had about 50,000 infantry, 6,800 cavalry and 3,000 artillery; Bragg 30,000 infantry, 14,000 cavalry and 2,250 artillery. The campaign was opened by Rosecrans on 23 June, when Mitchell's cavalry division moved from Triune, and drove Wheeler's cavalry back upon the infantry with sharp skirmishing at Eagleville, Rover and Unionville. At the same time General Granger, with part of his own corps and Brannan's division of Thomas', moved from Triune to Salem, and the rest of the army was ordered to be in readiness to march next morning with a good supply of rations. On the next morning McCook started from Murfreesboro, on the Shelbyville road, and then moved to the left for Liberty Gap, which was seized before night by R. W. Johnson's division, after a sharp skirmish with a part of Cleburne's division. Thomas advanced on the Manchester pike; Wilder's brigade of mounted infantry in advance drove some Confederate cavalry through Hoover's Gap to its southern extremity when it was fiercely attacked by infantry and held on until Thomas came up with infantry, when the Confederates withdrew, leaving Thomas in full possession of the gap. Two divisions of Crittenden's corps moved to Bradyville, near Woodbury. On the other flank Granger and Brannan advanced from Salem to Christiana, and Stanley, with a division of cavalry, moved through Salem and joined Mitchell at the intersection of the Salem and Christiana roads. During the day Mitchell had had a sharp encounter with Wheeler's cavalry at Middleton. Stanley, having driven Wheeler's cavalry back to Guy's Gap, on the 25th, joined Granger at Christiana. On the left Crittenden advanced to Holly Springs; Brannan joined Thomas at Hoover's Gap, and Rousseau's division closed up on Reynolds', which was skirmishing in advance of the gap. During the afternoon three brigades of Stewart's Confederate division attacked two brigades of Johnson's and one of Davis' at Liberty Gap, to regain it, under the impression that Rosecrans was intending to march his main body through it. The attack was repulsed with a Union loss of 231 killed and wounded; and a Confederate loss of over 400. On the 26th Thomas pushed the Confederates back to within five miles of Manchester; Crittenden followed Thomas; McCook remained at Liberty Gap and Granger at Christiana. Thomas had gained so much ground toward Manchester that it was now practicable to concentrate the whole army there and force Bragg to abandon his position or give battle outside his works, and the concentration began on the 27th. Early in the morning Thomas seized Manchester, capturing a few prisoners, and at midnight had concentrated his entire corps at that place, 12 miles from Tullahoma. McCook withdrew from Liberty Gap, and marching through Hoover's Gap followed Thomas. The steady advance of Rosecrans' columns on Bragg's right convinced the latter that it was impossible to hold the long line to Shelbyville, so, early on the morning of the 27th, Polk was withdrawn from that place to Tullahoma, Wheeler, with the cavalry, being left to cover his rear. Stanley's cavalry and Granger's corps advanced from Christiana, drove Wheeler from Guy's Gap and pursued him inside the intrenchments four miles north of Shelbyville, where Wheeler made a stand with Martin's division to cover Polk's wagon train then on the road from Shelbyville to Tullahoma. Wheeler was driven from the intrenchments by Minty's cavalry brigade and pursued into Shelbyville. He crossed Duck River and was about to burn the bridge when he was informed that Forrest, who had been ordered from Franklin to Tullahoma, was approaching with two brigades to join him, upon which he hurriedly recrossed to the north side of the river, with Martin, 500 men and two guns, and had scarcely crossed when the Union cavalry came charging right down the main street and toward the guns. These had been loaded with canister and were discharged when the Union cavalry were only a few paces from their muzzles. But the charging cavalry rode over Wheeler and his 500 men, took the guns and covered the entrance to the bridge. Wheeler ordered a charge, cut through a part of the thin Union line, dashed down the steep river bank and swam the stream. Wheeler, Martin and some of the men escaped, about 50 were killed or drowned, many were made prisoners. Forrest had turned back when near Shelbyville and making a detour of eight miles crossed the river and marched to Tullahoma. It was dark when the action closed and the Union troops bivouacked at Shelbyville. As Bragg had now been forced from his first line on the right and from Shelbyville on the left, Rosecrans directed his attention to force him from Tullahoma back beyond the Tennessee. Thomas began the movement. Early on the morning of the 28th Colonel Wilder, with his brigade of mounted infantry, started from Manchester to burn Elk River bridge and break the railroad south of Decherd, in the rear of Tullahoma, and to support the movement Col. J. Beatty's brigade marched to Hillsboro. The Elk River bridge was found too strongly guarded to warrant an attack and Wilder marched for Decherd, which was reached at 8 P.M. Wilder burned the depot and water-tank and had destroyed about 300 yards of the railroad, when he withdrew upon the approach of Confederate infantry. Next day he broke up the Tracy City Railroad, and then dividing his force advanced toward Anderson and Tantallon, on the railroad to Chattanooga. Both places were held in such force that he made no attack and uniting his command at University he returned to Manchester on the 30th. When Wilder moved out on the 28th Thomas threw two divisions in the direction of Tullahoma and next day there was a general movement on the place and on the night of the 30th the advance was within two miles of it; the three corps of Thomas, McCook and Crittenden closed up, and Stanley's cavalry had come over from Shelbyville and bivouacked at Manchester. The concentration was effected with great difficulty. When the campaign opened the weather was fair and the roads good, but on the second day a heavy rain set in which continued during the entire movement and the roads became almost impassable for artillery and the trains, making the operations exceedingly slow. On the 29th

Bragg was reinforced by General Buckner, with 4,000 men, from Knoxville, and he proposed to give Rosecrans battle at Tullahoma, but when his communications with Chattanooga were so seriously threatened, he concluded to withdraw, and on the night of 30 June abandoned Tullahoma and fell back beyond Elk River. Thomas advanced on the morning of 1 July and occupied Tullahoma, and Rosecrans ordered an immediate pursuit, but Bragg held the crossings of Elk River, the pursuit was abandoned and Bragg continued his retreat over the Cumberland Mountains and across the Tennessee River to Chattanooga, leaving middle Tennessee again in Union possession. The nine days' campaign was one of the most brilliant of the war. Rosecrans' loss was 84 killed, 473 wounded and 13 missing. Bragg's loss in killed and wounded is not known. Rosecrans reports that he left in his hands 1,634 prisoners and 11 guns. Consult 'Official Records' (Vol. XXIII); Van Horne, 'History of the Army of the Cumberland' (Vol. I); The Century Company's 'Battles and Leaders of the Civil War' (Vol. III).

E. A. CARMAN.

TULLOCH, tŭl'ŏk, **John,** Scottish educator and ecclesiastical writer: b. near Tibbermuir, Perthshire, 1 June 1823; d. Torquay, England, 13 Feb. 1886. After study at Saint Andrews he became assistant minister at Dundee (1844), and principal and professor of theology at Saint Mary's College, Saint Andrews, in 1854. He edited *Fraser* in 1879, and was dean of the Chapel Royal, London, in 1882. A broad theologian, and the founder of the Scottish Liberal Church party, he nevertheless championed orthodoxy, and opposed disestablishment. In 1872 he lectured in the United States. He published 'Leaders of the Reformation' (1859); 'English Puritanism and its Leaders' (1861); 'Beginning Life' (1862); 'The Christ of the Gospels and the Christ of Modern Criticism'; 'Lectures on Renan's Life of Jesus' (1864); 'Theology and Greek Philosophy in England in the 17th Century' (1872); 'Pascal' (1878); 'Movements in Religious Thought in Britain during the 19th Century' (1885); and several volumes of sermons. He gained the second Burnett prize of £600 for an essay 'On the Being and Attributes of God,' which was published under the title 'Theism: The Witness of Reason and Nature to an All-Wise and Beneficent Creator' (1855).

TULLUS HOSTILIUS, tŭl'ŭs hŏs-tĭl'ĭ-ŭs, king of Rome in succession to Numa Pompilius (672 B.C). He was a warlike monarch, in whose reign took place the combat of the Horatii and Curiatii. (See HORATII). He subdued and utterly destroyed Alba by treachery. He likewise conquered the Fidenates and Sabines. His death, after a reign of 33 years, is ascribed by some to lightning, by others to assassination by Ancus Martius, his successor.

TULSA, Okla., the county-seat of Tulsa County, situated on the Arkansas River in the heart of the Mid-Continent Field, of which it is the financial, commercial and transportation centre. Tulsa is known as "The Wonder City" and the oil capital of the world, there being more than 500 operating oil and refining companies located in the city. A survey of Tulsa shows that it has a greatly diversified industrial activity, giving employment to 14,640 men, with an annual pay-roll in excess of $20,000,000. Tulsa has eight large refineries, a number of iron works, boiler works, stove works, tool works, machine shops, glass factory, smelter and approximately 150 small and large industrial plants, and a number of wholesale and jobbing houses, several coal companies, 13 public service corporations. The city is served by the Atchison, Topeka and Santa Fé, the Midland Valley, the Missouri, Kansas and Texas and the Frisco railroads, with three local systems of street railways. Tulsa has a practically unlimited supply of natural gas, of cheap fuel oil and coal, which is being mined within a few miles of the city limits. The bank clearings in Tulsa for 1918 were $489,983,156, the clearings being the largest of any city in the State. Tulsa had, under the call of the comptroller of the currency on 4 March 1919, on deposit in the 10 local banks $51,427,337 and the bank clearings for the city average $1,500,000 per day. The building permits for Tulsa since 1 Jan. 1917 are $14,997,178, the permits for April 1919 being in excess of $650,000 and representing permits issued for 148 homes. Tulsa is a city of splendid homes costing from $3,000 to $150,000; of good substantial business houses and has a number of eight-story, 10-story, one 11-story and one 17-story office building. The elevation of Tulsa is 750 feet and the average rainfall 36 inches with a mean temperature of 60°. The city has a fine convention hall, seating 4,000 people; a new Y. M. C. A. building, costing a quarter of a million dollars; a Y. W. C. A. building, costing approximately the same amount; a splendid public library; a modern county courthouse; a fine municipal building; an imposing government post-office building, with numerous club buildings. There are 30 churches; 475 schoolrooms built largely on the unit system, with a high school costing $550,000 and $1,000,000 was recently voted for the extension of the educational facilities. The county is now spending $2,000,000 for permanent hard surfaced roadways under a recent bond issue. Stock-raising, dairying and diversified farming are successfully conducted in Tulsa County and the truck grower has wonderful opportunities presented along the valley lands of the Arkansas River. Tulsa is known as the millionaire city, the local Chamber of Commerce having one committee of 50 men with every member of it worth more than $1,000,000 and some of them worth more than $10,000,000, these fortunes having been made from the oil industry in the Mid-Continent Field. The city is the headquarters for oil field supplies for Kansas, Texas and Oklahoma and is the financial clearing point for the great oil transactions of the Mid-Continent Field. All of the fraternal organizations which are popular in the Southwest are represented; there are six noon day lunch clubs of civic societies; beautiful parks, paved boulevards and paved streets, stately homes and modern business establishments. In the late war the city gave more than 10,000 men to the war and war work through three volunteer military units and through the draft and recruiting offices. Tulsa subscribed for the Liberty Loans as follows: First, $5,685,000;

SECTION IN THE BUSINESS DISTRICT OF TULSA, OKLA.

second, $6,450,000; third, $4,623,400; fourth, $8,240,560; fifth, $5,300,000. There are seven newspapers and periodicals published in Tulsa. The Tulsa *World* and Tulsa *Times* are the morning papers; the Tulsa *Democrat* and the Tulsa *World* are the afternoon papers. The Tulsa *Spirit*, the official organ of the Chamber of Commerce and Allied Interests of Tulsa, is a monthly publication with a national circulation. The city is under the commission form of government, having a mayor and four commissioners. The police and fire departments are efficient and well organized, being provided with every modern equipment for the protection of life and property. From a population of 1,390 in 1900, the city had grown to 78,755 in 1918.

TUMACACORI MISSION NATIONAL MONUMENT. In southern Arizona, 45 miles south of Tucson on the Nogales branch of the Southern Pacific Railroad. The full name is Saint Joseph of Tumacacori. It was founded within a year or two of 1687 by Fathers Francisco Kino and J. M. Salvatieraz, Jesuit missionaries to the Indians. The building which is in the form of a Greek cross with basilica was built of adobe bricks, plastered with cement and coped with burnt brick. The roof was flat and covered with tiles. The basilica remains. It was near the old presidio of Tubac in a rich valley and was at one time an important centre. This mission and 10 acres surrounding it were donated to the government in 1918 and made into a national monument.

TUMAL, the name given by the Avars to the Kasikumuks (q.v.).

TUMBREL. See DUCKING-STOOL.

TUMERIC PAPER. See TEST-PAPERS.

TUMOR (Lat. *tumor,* from *tumeo,* to swell). Terms frequently used in the same sense are new growth, neoplasm, malignant disease. A neoplasm or tumor in the narrower sense is a new formation of tissue, apparently arising and developing independently, atypical in structure, inserted uselessly into the body, possessing no function of service to the organism and showing no typical termination to its growth. (Ziegler).

The frequency with which tumors occur, the resistlessness with which many of them carry their victims on to a painful death and our ignorance in regard to their true nature combine to render their study one of the most interesting and important departments of pathology. In spite of the enormous amount of research which has been devoted to this field we must admit that though the *histogenesis* or structure of tumors is now fairly well understood, their *pathogenesis* or underlying principle of causation is still shrouded in mystery. We have learned that the ultimate cells and tissues which make up the substance of these new growths are the same in type as those normally occurring in the body, and that each structural element of the tumor is derived from a pre-existing element of similar nature, but what was the force or stimulus which enabled these cells to break the laws of inter-relationship which ensure the normal development and function of each part of the body is still unknown. See CELL; DEVELOPMENT HYPOTHESIS; HEREDITY; HISTOLOGY.

It is this tendency to assume an independence of existence and to flourish in opposition to the physiological restraints to which normal cells are subject in their growth and function that characterizes tumors and forms the chief point of difference between them and certain inflammatory and other tissue proliferations. In short, a tumor is an overgrowth of tissues beginning locally, but frequently, by various methods of extension, invading near or remote regions, which is never of use to the body and frequently is directly hostile to it. The lower animals, particularly mammals, are subject to the same aberrancies of cell growth, and tumors comparable to those occurring in man are observed in all the vertebrates. Plants also exhibit analogous formations. See VETERINARY MEDICINE.

General Characters of Tumors.—As has been indicated, the integral structural units of tumors may always be traced back to normal types, and each class of new growths takes origin from corresponding normal tissues. Thus epithelial tumors spring from epithelial tissues, connective tumors from connective tissues, etc. Viewed as a whole a tumor is a true parasite, since it leads an independent existence, deriving nourishment from its host without in any way contributing to the latter's welfare. The processes of growth, nutrition and cellular reproduction go on in tumors much as in normal tissues and they are provided with a connective tissue framework, blood and lymphatic vessels and nerves to provide for their vital needs. Interference with nutrition or other causes lead to degenerative changes and necrosis, and inflammation, cicatrization, ulceration, etc., take place in their customary manner. A tumor may continue to increase indefinitely in size, or it may in some instances become quiescent in growth and remain without change for longer or shorter periods of time. The growth of the tumor goes on independently of the rest of the body and often is at its expense; thus a lipoma or fatty tumor may continue to extend in size even after the body's reserve of fat has become exhausted. Growth is effected by three different means: (1) By central or expansile growth due to increase of elements within the tumor, so that the surrounding tissues are pushed aside. This has been likened to the increase in size produced by inflating a rubber balloon. (2) By infiltration, that is, the outlying portions of the tumor push their way into the surrounding tissues as do the roots of a growing plant. (3) By metastasis. The importance of this method of growth lies in the fact that it represents the means of dissemination by which remote parts of the body may be invaded. The blood or lymph vessels are broken into and bits of tumor tissue travel to a greater or less distance till they lodge in some tissue or organ and form initial foci of secondary or daughter tumors. In carcinoma the adjoining lymphatic glands through their close connection with the lymph current are usually the first structures to be secondarily invaded. From a clinical standpoint it is usual to divide tumors into two great classes: (1) Malignant; (2) non-malignant. There is also a small group of neoplasms which stand between these two and are sometimes malignant and sometimes behave like benign growths. The malignant tumors (or what in popular parlance are called "cancers") embrace the carcinomata and sarcomata and possess certain invariable character-

istics: (1) Their growth is by infiltration and destruction of the surrounding tissues; (2) they form secondary growths by metastasis; (3) they are difficult to extirpate surgically and tend to recur locally; (4) they induce a general disturbance of health known as cachexia. By this is meant a condition of defective nutrition due wholly or in part to the demands on the body made by the growth of the tumor, to its interference with digestion or food absorption if situated in certain parts, as the œsophagus or stomach, to the loss of albuminous material through the constant discharge from ulcerating areas, to the absorption of deleterious substances arising from putrefactive changes in the tumor, to hemorrhage, to the pain and resulting loss of sleep, anxiety, etc. It is possible that the tumor itself produces a poison which contributes in producing cachexia, but portions of human carcinomata introduced into the tissues of experiment animals if free from bacterial contamination do not appear to exert any toxic effects.

The benign tumors, on the other hand, are distinguished by usually being encapsulated so that they can be easily extirpated through the absence of any tendency to form metastases. They are dangerous to life only through compression of important organs, but it must be remembered that their position may in this way give rise to most serious conditions. Many varieties are also extremely liable to become the seat of malignant degeneration.

Theories of Causation and the Occurrence of Tumors.— Comparatively little is yet known in regard to the actual causes of tumor formation. Many highly ingenious theories have been elaborated, but plausible as they may seem they are mere speculations and none of them can be said to be satisfactory from every point of view. Cohnheim in 1882 promulgated a doctrine which has many adherents and affords a rational explanation at least for congenital tumors and for many benign new growths. Briefly stated, his view is that during the development of the embryo (see EMBRYOLOGY) small clusters of cells become displaced from their normal surroundings and form little islets of tissue different in nature from their environment. These cells remain alive, but lie dormant until some stimulus stirs them into activity and they then form the nucleus for tumor formation. Having once started to proliferate they exhibit the intense vital energy of embryonal tissue and develop untrammeled by the restraints imposed upon normal cell growth. This theory has much in its favor, such as the tendency of many tumors to develop in regions which correspond to embryonal foldings, and to assume embryonal types of structure, but it is impossible to demonstrate any such displaced aggregations of cells, and clinical observations in many cases are strongly against it. A somewhat broader and more general view is taken by Ribbert, who believes that through some means, perhaps as the result of injuries or inflammation, numbers of healthy cells become cut off by bands of connective tissue and are thus isolated from the physiological restraints which ordinarily keep the cellular capacities within normal bounds. As a result of this liberty, excessive growth and perverted activity, in other words, tumor formation, occur. Hansemann denies that mere segregation of cell groups can have this result and accounts for the great intensification of vitality necessary by assuming a change in the individual cells, termed anaplasia, consisting in a loss of differentiation and increased capacity for independent existence. According to this writer two factors, anaplasia and a proliferative stimulus, are necessary for tumor formation. It will be seen that these theories leave much to be desired, but it is probable that the truth lies in this direction of cytological research and that as we gain a deeper insight into the physiology of the normal cell our understanding of these complex perversions of growth will be correspondingly increased.

Much has been written of late on the parasitic origin of tumors, particularly of carcinoma, and bacteria, yeasts and protozoa have all been described and figured in great detail as causative agents. None of these so-called cancer parasites has, however, been able to withstand the crucial tests of cultivation and of reproducing the tumors on inoculation into animals, and it has also been impossible so far to infect animals of one species with tumor tissue derived from another. Belief in the infectious nature of carcinoma is shared by very few observers at present, and it is probable that the instances in which carcinoma has occurred in people intimately associated, as husband and wife, are either due to coincidence or to direct transplantation of cancer cells. So-called "cancer houses" and cancer districts are described, but such observations are too fragmentary and unreliable to be taken as the basis for generalizations.

Climatic, racial and geographical features have been drawn into the discussion by some authors, as well as matters of diet; for example, habitual over-indulgence in meat. In connection with this latter point it is an interesting fact that carcinomata are said to be much less frequent in herbivorous than in carnivorous animals. On the other hand carcinoma is not uncommon among religious sects in the East that are strict vegetarians.

Injuries, both acute, such as blows and falls, and in the form of long-standing irritation, undoubtedly have some connection with tumor formation. Acute trauma is most often associated with tumors of the connective tissue group, and chronic trauma with carcinomata. Typical examples are found in the cases in which sarcoma follows bone injuries, and carcinoma of the lower lip is apparently produced by the constant irritation of pipe smoking or of a roughened tooth. Certain occupations which involve chronic irritation of the skin through chemicals, such as tar or paraffin products, also seem to predispose toward tumor formation. Too much importance must not be attached to this factor, however, for it has never been possible to produce tumors in animals experimentally in this way, and in the cases in which new growths have followed trauma there was probably some already existing predisposition.

Age.— The liability to different sorts of tumors varies very considerably with different periods of life. In childhood and in early adult life carcinomata are rarely seen and of the malignant tumors sarcoma predominates, while the reverse is the case after the age of 30. To this rule there are many exceptions, however. When young people do acquire carcinoma the

disease is always of extremely virulent type, whereas in the very aged its development is slower and in particular the formation of metasases is much less extensive.

Sex.— Carcinoma is much more frequent in women than in men and the organs of predilection also differ in the sexes. In men the tongue, lips and stomach are oftenest attacked, while in women the disease is most commonly seen in the breast or uterus.

Heredity.— The tendency of modern pathologists is to ascribe less and less importance to heredity as a cause of tumor formation. Statistics are particularly misleading in this regard and while it is undoubtedly true that in a considerable proportion of cancer cases more or less remote members of the same family have been similarly affected, a like inquiry into the antecedents of healthy persons would show approximately similar results. A celebrated case is that of Napoleon I — who, as well as his father and two sisters, died of carcinoma of the stomach. Carcinoma is a common disease and, therefore, appears frequently in the same family; sarcoma is rare and so has less appearance of hereditary transmission.

Increase of Malignant Disease.— The statistics of recent years show that throughout the world, but particularly in England, there seems to be a marked increase in the occurrence of carcinoma. Roswell Park says that if the ratio of increase in the number of cancer deaths in New York State continues unchanged for the next 10 years the mortality from this cause will be greater than that of pulmonary tuberculosis, smallpox and typhoid fever combined. These figures cannot be accepted without some reservation, however, for undoubtedly the diagnosis is now made in cases that were formerly unclassified, autopsies are more frequent and the causes of death are more definitely indicated in death certificates. Also through municipal sanitation, improved methods of medical treatment, more widespread dissemination of the laws of hygiene, etc., a greater number of people now live to reach the age when carcinoma is frequent. The increase seems to affect principally those of the upper ranks, in contradistinction to tuberculosis which spreads most actively among the proletariat.

In conclusion, it may be said that probably no one cause underlies the formation of all types of tumors, but that possibly widely differing factors may be concerned in the production of the different varieties.

Classification of Tumors.—Until our knowledge of the causes of tumors becomes more exact, a satisfactory classification is impossible. The so-called histogenetic classification based on embryological data is open to many objections, as well as various other systems proposed. The following table is taken from Delafield and Prudden's 'Handbook of Pathological Anatomy and Histology.'

Connective-Tissue Type.

Normal Tissue.	*Tumors.*
Fibrillar connective tissue.	Fibroma.
Mucous tissue.	Myxoma.
Embryonal connective tissue.	Sarcoma.
Endothelial cells.	Endothelioma.
Fat tissue.	Lipoma.
Cartilage.	Chondroma.
Bone.	Osteoma.
Neuralgia.	Glioma.

Muscle-Tissue Type — Myomata.

Normal Tissue.	*Tumors.*
Smooth muscle tissue.	Leiomyoma.
Striated muscle tissue.	Rhabdomyoma.

Nerve-Tissue Type — Neuromata.

Vascular-Tissue Type — Angiomata.

Normal Tissue.	*Tumors.*
Blood-vessels.	Angioma.
Lymph-vessels.	Lymphangioma.

Epithelial-Tissue Type.

Normal Tissue.	*Tumors.*
Glands.	Adenoma.
Various forms of epithelial cells, and associated tissues.	Carcinoma.

To these may be added the following two groups:

Teratomata and Cystomata.

It will be observed that the designation for each form is derived by adding the suffix *-oma* to the technical name of the corresponding tissue type, and for mixed tumors compound names are formed, as adeno-carcinoma, myxo-sarcoma, etc.

Different Varieties of Tumors.— *Malignant Tumors — Sarcoma.*— Sarcomata are tumors of the connective tissue group, composed of cells, embryonal in type, which are disproportionally numerous in comparison to the basement substance, so that the tumor as a whole is usually soft and pulpy in contradistinction to the stony hardness of carcinomata. They are characterized by extreme vascularity, the new formed vessels often being mere channels between the tumor cells, and the tendency to form metastases by means of the blood current rather than the lymphatics. Their cells may be of many varieties and the following chief types are recognized: (1) Large and small spindle celled; (2) large and small round celled; (3) giant celled; (4) melano sarcomata, which contain pigment, frequently arise from pigmented moles and are extremely malignant. Mixed tumors, such as osteo-sarcomata, angio-sarcomata, etc., frequently occur. Sarcomata may arise from bone, the brain and spinal cord, the breast, the kidney, uterus and lymph glands. They grow rapidly, owing to their vascular structure, are prone to necrotic changes and if situated on the surface of the body break down and ulcerate. Sarcoma is not common, is a disease of early life, rarely appearing after the age of 40, and frequently is a sequel of injury or inflammation. In many respects sarcoma behaves like a growth due to some parasitic infection.

Carcinoma.— Carcinomata, or cancer in the true sense, are tumors composed of a more or less dense connective tissue framework, holding in its meshes epithelial cells. These exhibit much diversity of type and arrangement, so that several classes are recognized. (1) Epithelioma. This is the form which commonly occurs on the skin, at the muco-cutaneous junctions, such as the lips, about the nose and eye, and on the mucous membranes covered with squamous epithelium, as the mouth, œsophagus and cervix of the uterus. On the face a slowly growing form known as Jacob's or rodent ulcers is sometimes seen which may last for years and is rarely fatal. On the skin or lip epithelioma begins as a warty protuberance which soon ulcer-

ates and gradually extends in size until a sore with hard irregular base and edges, and foul bloody discharge, is formed. (2) Cylindrical celled carcinomata. These occur in the stomach, intestines and uterus. (3) Carcinoma simplex. This displays great irregularity in the shape of its cells and is the commonest form attacking the internal organs. If the connective tissue is in excess, the dense, hard *scirrhus* carcinoma results; whereas if the cellular elements preponderate, the tumor is termed a *medullary* cancer or *carcinoma molle.*

About 80 per cent of the tumors of the female breast are carcinomata. The disease is rare before the age of 35, is most common between 45 and 55 and in women who have borne children. The negro race is much less susceptible. It begins as a hard nodular mass not painful to pressure, which soon becomes firmly fixed to the tissues and causes retraction of the nipple. The axillary lymph-glands are invaded early and can usually be felt as small hard nodules. In neglected cases the skin over the tumor ulcerates and there is a foul discharge. The arm becomes swollen and useless, and pain of neuralgic nature is usually present. The bones, liver, pleura and brain are often attacked secondarily.

Carcinoma is usually disseminated by the lymph stream and promptly invades the lymphatic glands. According to Birch-Hirschfeld the following are in order of frequency the organs most often primarily attacked: Uterus, external skin, female breast, stomach, rectum, œsophagus, ovary, testicle, external genitals, prostate and bladder, pancreas, kidney, intestine, bile ducts, liver, bronchi. It is a disease of mature life and is not often seen before the age of 30.

Intermediate Tumors.— *Adenoma.*— Adenomata correspond in general structure to normal glands, but either do not secrete or are unable to discharge the secretion through the gland ducts. They grow slowly, but may reach a large size, particularly if distended by accumulated secretion. In this case they are termed cyst-adenomata, and the oftentimes huge ovarian cysts belong to this class. Many goitres (q.v.) are adenomatous tumors. Adenomata are in themselves benign, but are prone to take on carcinomatous tendencies and then become very malignant. They occur in the breast, the ovary, the thyroid gland, the kidney, salivary glands, stomach, intestines and uterus.

Endothelioma.— This tumor springs from the cells lining the blood vessels and lymph spaces and has much in common with both the carcinomata and sarcomata. Endotheliomata differ greatly in their virulence, but at times behave much as do sarcomata. They occur in the membranes of the brain, the pleura and peritoneum, the salivary and lymph glands. Growths of the parotid gland are frequently of this type.

Benign Tumors.— *Fibroma.*—This is a growth composed of bundles of fibrillar connective tissue. Two main types, the hard and the soft, occur. Fibromata frequently appear in young adults and may arise in any part of the body containing connective tissue. They are often seen in the skin, mucous membranes, the breast, in fibrous membranes, nerves and the gums, and are often associated with other forms of tissues in complex tumors. They are usually well encapsulated and may be single or multiple. Ordinary warts and moles and some nasal polypi are fibromata. One form not infrequent in women arises in the subcutaneous tissue, gives rise to severe attacks of pain and is called painful subcutaneous tubercle. Keloid is a form occurring in scars, which is most common in negroes and is very hard to eradicate.

Myxoma.— This tumor is made up of tissue embryonic in type and called mucous tissue. Myxomata are soft and elastic, grow slowly and are usually considered benign, though they have a tendency to recur and sometimes undergo sarcomatous change. They frequently occur as polypi (see POLYPUS) in the nose, where they give rise to chronic catarrh, and are also found in glands such as the parotid and breast, the subcutaneous and submucous tissues and the sheath of nerves. Myxomatous tissue is often found in mixed tumors.

Lipoma.— Fatty tumors are among the commoner growths and are composed of lobules of fat held in a stroma of connective tissue. They are most often seen in middle life, and the skin of the back or shoulders is a favorite site. They may be multiple and sometimes occur as diffuse fatty enlargements about the neck. The yellowish patches often seen about the eyelids in old persons are a form of lipoma called *Xanthoma.*

Osteoma.— Osteomata are composed of bone and usually originate in bone, periosteum or cartilage, though they may spring from other types of connective tissue. They grow slowly, are benign and are often multiple. A special form known as odontoma or dentigerous cyst develops from the germ of the permanent teeth.

Chondroma.— This is most often met with in the young and is composed of hyaline and fibrocartilage. Chondromata may form from the long bones, the pelvis, cartilage or in glands like the parotid and testicle. In the latter situations they are especially apt to become sarcomatous. Chondroma is frequently preceded by rickets in infancy. The so-called "joint-mice" or floating cartilages in joints are often pedunculated or broken off chondromata.

Glioma.— Gliomata are tumors developing from the neuralgia or supporting tissue of the central nervous system. They are found in the brain, spinal cord and cranial nerves. Some forms, particularly those occurring in the retina during childhood, are closely allied to the sarcomata, and owing to its situation glioma is always a source of danger.

Myoma.— Two varieties of myomata are recognized: (1) Leiomyoma, composed of unstriped muscle cells and more or less fibrous tissue; (2) rhabdomyoma, which is rare, and contains striped muscle cells and spindle cells. Growths of the first class are found in the œsophagus, stomach and intestine, the skin, bladder and ovary. They are commonest, however, in the uterus and its male analogue, the prostate gland. In the former situation they form the so-called uterine fibroids which often attain large size and may menace health through hemorrhage or pressure on adjoining structures. The prostatic enlargement of old age is due to leiomyoma of the gland. Myomata are tumors of later life.

Neuroma.— Tumors composed of nerve tissue or true neuromata are rare, arise in middle

life and are apt to be accompanied by severe pain or paralysis. False neuromata are tumors developing in the connective tissue sheaths of the nerves and may be fibromata, myxomata, etc. Traumatic neuromata are frequently the cause of the painful stump following amputations.

Angioma.—Angiomata are of two sorts: (1) Hæmangioma, consisting of dilated blood-vessels, and (2) lymphangioma, composed of dilated lymph-vessels. The first type is subdivided into (*a*) capillary hæmangiomata and (*b*) cavernous angiomata. Capillary angiomata or nevi form the so-called mother's marks, port wine stains or strawberry marks with which infants sometimes come into the world. These are patches of distended cutaneous capillaries or venules, and if small can be obliterated by electrolysis. Larger ones are treated by excision. Cavernous angiomata are made up of large vessels and if on the surface of the body may form swellings of considerable size. Lymphangiomata are usually congenital, but may be acquired and vary in size as do the hæmangiomata. With both classes of angioma there is danger of rupture and serious hemorrhage or escape of lymph.

Cystomata.— These are benign tumors filled with fluid the result of the activity of the cells lining the cyst wall, which is the real new growth. Many forms of cystomata belong to the adenomata; others occurring about the neck are the result of faulty closure of embryonic openings and are called branchio-genetic cysts. Cysts due merely to accumulation of secretion through stoppage of the duct of a gland, as the sebaceous cysts of the skin ("wens"), or resulting from parasitic infection as the hydatid echinococcus cysts (see HYDATID), are not grouped with true tumors.

Teratomata.— These are tissue formations of embryonic origin which frequently exhibit great complexity of composition and contain such diverse structures as bone, teeth, skin, hair, cartilage, muscle, glands, etc. Cysts of this sort are called dermoids and are especially common in the ovary and regions where folds of the developing embryo come in contact, as at the orbital angles, the neck and the base of the spine. Theoretically, teratomata are to be classed with the malformations rather than with the tumors. See TERATOLOGY.

The Diagnosis of Tumors.—In dealing with conditions likely to lead to results of such gravity as are involved in tumor formation, prompt recognition of the nature of the case is of the utmost importance. If taken at a sufficiently early stage both carcinoma and sarcoma can be cured by operation and impending danger from benign growths be recognized and averted. Swellings and ulcerations about the face and especially the lips and tongue which do not promptly disappear are, in older people, most suspicious. The formation of hard masses in the female breast should also be called to the attention of the physician as soon as noticed, and excessive menstrual flow or hemorrhage between the periods in younger women suggest the possible existence of uterine fibro-myomata. A bloody or malodorous discharge subsequent to the menopause is very likely to be due to carcinoma of the uterus. Dyspepsia in older people together with loss of weight point toward malignant disease of the stomach, and indefinite abdominal pain, emaciation, obstinate constipation or alternating diarrhœa and constipation, especially if there be blood in the stools, are strongly suggestive of a new growth of the intestine. It cannot be too strongly emphasized that delay is fraught with the greatest danger and may make cure impossible or add immeasurably to the difficulties of the operation. In doubtful cases where tumors are accessible it is the custom of surgeons to excise small bits of tissue and submit them to microscopic examination to determine their nature. In obscure abdominal disorders an exploratory laparotomy may be the only means of establishing the diagnosis. The procedure itself is as free from danger as any surgical manipulation requiring a general anæsthetic can be, and if malignant disease is present it may be possible to eradicate it and save the patient from the miserable death which is otherwise inevitable.

The Treatment of Tumors.— In general it may be said that for most tumors the proper treatment lies in their removal when feasible at the earliest possible moment. Modern surgery has made possible operations which formerly were unheard of and the chances of the patient afflicted with malignant disease are constantly improving. The older surgeons operated to prolong life or to make existence more bearable till death came as a relief: the surgeon of today operates to cure. Large portions of the stomach are frequently excised for carcinoma, and many cures are reported. Intestinal resection makes the extirpation of new growths in this region possible, while the technique of uterine operations has been developed to such a degree that fibromyomata can be removed with comparatively little risk, and even carcinoma in this situation has lost some of its terrors. Malignant tumors of the breast are permanently cured in from 40 to 50 per cent of the cases, the success being due to the thoroughness with which modern operators remove the tissues under the breast and the enlarged glands in the axilla, and statistics are showing constant improvement in the operative results in all forms of malignant disease. See SURGERY.

Various other plans of treatment are employed to some extent. Inoperable sarcomata have been greatly benefited by injections of bacterial toxins, and in the use of various forms of light-rays from the violet end of the spectrum, the X-rays and in the emanations from radio-active substances we have promising adjuncts to surgery. See PHOTOTHERAPY; RADIUM THERAPY.

Caustics are rarely successful in the treatment of malignant tumors and their application is always painful and leaves disfiguring scars. Charlatans of various types diagnose all sorts of conditions as cancers and proceed to cure them with great *éclat;* when actual malignant growths are encountered by them the time lost in this way before the necessity for proper advice is realized usually costs the patient's life.

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TUMULUS, an ancient artificial mound, often of large size, raised usually over the tomb of some prominent person. The custom appears to have been universal in the early historic period. As it required the use only of earth, and of rude stones for a sepulchral chamber, it was the only feasible method by which races in a low state of development could commemorate their dead, the tumulus was continued after architecture had made some progress. In ancient as in modern times, where large numbers of dead were heaped together, and it was desired to honor them all, the tumulus was the only monument that could be conveniently provided. The vast grave at Salisbury, N. C., in which thousands of Union dead are interred, is a tumulus as much as any of the great burial mounds of the ancients. Similar constructions are even now being heaped on modern battlefields.

The Bible and Homer give examples of tumuli. They are found in North America, Mexico, Central and South America, in Great Britain and Scandinavia, in Asia and Africa. They are not in all instances burial mounds. The Bible, in Genesis, xxxi 44–55, relates the erection of a "heap," or tumulus, as evidence of an agreement as to boundary between Laban and Jacob. It is probable that some of the mounds were ancient forts. That at Silbury Hill, Wiltshire, England, 170 feet high, may not have been a sepulchre, and some of the American mounds were sacrificial, and others may have been places of defense. Indeed all three uses — sepulchral, sacrificial and defensive — may have been included in a mound. It is also certain that some tumuli are simply residential ruins, the crumbled remains of adobe dwellings, or, in the desert regions of Asia and Africa, sand heaps rising as the sole memorials of vanished and once populous cities. See MEGALITHIC MONUMENTS; MOUND-BUILDERS.

TUMUT, tū'mŭt, Australia, a town in New South Wales, southwest of Sydney. It is in a mountain valley 1,050 feet above sea-level, on the slope of a hillside on the south bank of the river Tumut, from which the town takes its name. The Tumut does not dry up like most Australian rivers, during the hot weather, but remains at continual high water mark owing to the melting snows of the neighboring mountains, the loftiest of which is Mount Kosciusko, the culminating point of the entire continent. The town has four banks, four churches, schools and a lecture hall. Pop. about 1,200.

TUN. The old form of spelling for ton. It is still used to some extent for a cask or vat of liquor. See TON.

TUNA. See TUNNY.

TUNA, a cactus. See PRICKLY PEAR.

TUNBRIDGE (tŭn'brĭj) **WELLS,** England, in Kent, a watering-place and market-town, 35 miles southeast of London. It occupies detached hills with fine views and picturesque surroundings. At the end of the fine parade, the "Pantiles," are medicinal springs, which have been honored by royal and distinguished patronage since the 17th century. The common contains 170 acres. The principal buildings are a church, public and society halls, convalescent home for children, mechanics' institute, Nevill's club and pumproom. Tunbridge ware, consisting of fancy inlaid work or mosaics, is sold extensively. The original town of Tunbridge (pop. about 13,000), a wool-trade centre, is four miles to the north. Pop. of Tunbridge Wells about 35,000.

TUNDRA, toon'drą, the Russian name for the extensive low-lying, swampy peat-mosses which compose a considerable part of the great Siberian plain and that of North Russia. From June till the middle of August the tundras are thawed to a small depth, and are seen covered with mosses and lichens, among which there are sprinkled a few flowering plants. Many furred animals, along with various migratory birds, resort to the tundras for the short summer season.

TUNGSTEN (Wolfram), a metallic element found in the minerals scheelite ($CaWO_4$), wolframite [$(FeMn)WO_4$], hübnerite ($MnWO_4$) and ferberite ($FeWO_4$). It occurs in veins and in placer (q.v.) deposits. The most important occurrence is the placer tungsten of Burma. Portugal is also an important producer. In the United States, the important occurrences are in Bowlder County, Colo., San Bernardino County, Cal., and in the Black Hills of South Dakota. The pure metal is obtained by the Goldschmitt process (see THERMIT), that is, by the reduction of tungstic acid by aluminum filings; also by reduction of the oxide by heating with charcoal in an electrice or regenerative gas furnace. It is malleable and hard enough to scratch glass. Not acted upon easily by mineral acids. Atomic weight, 183.6; symbol, W; specific gravity, 16.6. It forms a number of compounds, among which are the chlorides WCl_2, WCl_4, WCl_5, WCl_6, the oxide WO_3, and the acid $WO(OH)_4$. Tungsten is used extensively alloyed with other metals, as iron and aluminum, to which it imparts very desirable properties. Tungsten steel is very hard and tough, highly magnetic, not easily rusted and has the valuable properties of self-hardening. The alloy of tungsten and aluminum known as partinium is very light and tough and is used largely in automobile construction. It is also used in incandescent lamp filaments. See MINERAL PRODUCTION OF THE UNITED STATES.

TUNGUSES, toon-goo'sĕz, a leading branch of the Mongol division of the Mongol-Tatar family, small in numbers but extending over a vast area from the Pacific in the west to the Yenisei River in the east. The race is found along most of the seaboard from Korea and Kamchatka, where a war was being carried on in 1904 between Russia and Japan. The Manchus, who conquered China, and are the rulers of that empire, are of Tungus stock, and from the same source came, in the remoter past, a large part of the savage and half-savage hordes that swept over lower Asia and western Europe. The Tunguses are now a dwindling race. Their morals are good, and their religion is chiefly the aboriginal Shamanism, although

some have been converted to Christianity and Buddhism. Their name is said to be derived from a Chinese word signifying "people." The Tunguses on the higher Pacific Coast are called the Lamuts, or "sea-people," and those in the vicinity of the Amur and Korea are called by the Russians the Tazi. The Tunguses, exclusive of the Manchus, are estimated at about 80,000 in number, of whom about 15,000 are in the Amur Basin, and the others in Siberia. See MONGOLIAN RACE; SIBERIA; TUNGUSIC.

TUNGUSIC, a language spoken over hundreds of thousands of square miles of Asia, by the people known as Tunguses. Manchu is a dialect of this language. It is a Mongol tongue, of a low grade of development, having no verbs, and possessing no distinction of number and person in the predicative words. See TUNGUSES.

TUNGUSKA, rivers of Siberia. The three large rivers of Irkutsk, which unite to form the Yenisei are known as the Upper, Middle (or stony) and Lower Tunguska. They drain an area of about 800,000 square miles. The Upper and the Lower Tunguska are each rivers about 1,800 miles long, and they unite at Turukhansk, just south of the Arctic circle. The upper branch drains Lake Baikal. See SIBERIA.

TUNIC, an ancient form of garment in constant use among the Greeks; a sort of short-sleeved shirt. Among the Romans the tunic was an under garment worn by both sexes (under the *toga* and the *palla*), and was fastened by a girdle or belt about the waist. The woman's tunic was often long like the modern chemise. Soldiers often wore the tunic without the toga, as some workmen to-day wear a blouse. When ornamental, it sometimes became an article of ceremonial dress, as the purple-bordered *laticlavus* of senators. The Anglo-Saxons of the Middle Ages also wore a tunic, much like a skirt, and often tied at the waist. The term is also used ecclesiastically to denote a dress worn by the subdeacon, made originally of linen, reaching to the feet, and then of an inferior silk, and narrower than the dalmatic of the deacon, with shorter and tighter sleeves.

TUNICATA, or UROCHORDA, a class of animals of the phylum *Chordata* (q.v.), commonly represented by the Ascidians (q.v.) formerly much misunderstood. Since Kowalewsky's description in 1866 of the development of an ascidian, it has been clear that these animals, together with all the other tunicates, must be associated in the zoological system with Amphioxus and the true vertebrates. Most tunicates pass through a free-swimming, tadpole-like, larval stage (and a few remain permanently in this condition) which has in the tail or swimming organ a notochord and a tubular central nervous system, both of which develop in essentially the same manner as in other vertebrates. The fore part of the alimentary canal is perforated by pores or stigmatæ opening to the exterior and serves as a respiratory organ. After a short free-swimming period, the larva attaches itself in typical cases and the tail is gradually absorbed with its contained organs, so that both notochord and tubular nerve cord disappear, a remnant of the latter in the body becoming the ganglion of the adult. The *Tunicata* comprise three orders: The *Larvacea,* including forms of small size and simple structure, which retain the larval tail throughout life. *Appendicularia* is an example found abundantly among the surface fauna of our coasts. The *Thaliacea,* including almost exclusively free swimming pelagic forms which have no tail in the adult and seldom a tailed larvæ. They form compound colonies and exhibit an alternation of generations. *Salpa* (q.v.) is an example. The *Ascidiacea,* including usually fixed, simple or compound forms, with usually well-marked larvæ, but no tail in the adult state. *Molgula cynthia, Boltenia* and *Amaræcium* are common genera on our coasts. See ASCIDIAN. Consult Herdman, 'Challenger Reports,' Vols. VI and XIV, London (1882 and 1886); Verrill, 'Invertebrates of Vineyard Sound' (Washington 1874).

TUNING. See REED, FLUE AND STRINGED INSTRUMENTS, TEMPERAMENT, TUNING AND VOICING OF.

TUNING-FORK, *in music,* a piece of steel having two parallel forks or prongs of equal dimensions, constructed and tempered so as to give a definite note when caused to vibrate. Tuning-forks are small and easily carried in the pocket. They may be sounded by striking against any convenient solid object. Large tuning-forks are used for lectures on acoustics, fixed on sounding-boxes, and caused to vibrate with a resined hair-strung bow.

TUNIS, tū'nĭs (AFRIKIYA), North Africa one of the old Barbary States on the Mediterranean coast, formerly tributary to Turkey, and now a French protectorate, bounded on the north and east by the Mediterranean Sea, on the south by Tripoli and on the west by Algeria. It extends about 400 miles from north to south, 150 miles from east to west and has an area of 38,450 square miles. The coast is indented by the three large gulfs of Tunis, Hammamet and Gabes. It is bordered by a low, sandy and desert region in the east and by precipitous mountains in the north. The northern part of the country is a plateau, becoming very mountainous in the extreme north. The southern part is a flat steppe region, lying partly below sea-level, and containing large tracts of salt marsh. The principal river is the Mejirda, in the north. The northern mountains are covered with large oak forests, and contain very fertile valleys. The principal minerals exploited are salt, nitre and phosphates, iron, lead and mercury. Large numbers of cattle, sheep, camels and fine horses are raised. Agriculture is less developed, though climate and soil in the north are favorable. There is some vine and oil culture, and considerable fisheries along the coast, but the industries are not important. The principal commercial ports are Tunis-Goletta, Susa and Sfax. The chief exports are vegetables, oil, phosphates and mineral ores, esparto-grass, livestock and cattle products, sponges, dyes and fruits. The total value of exports in 1916 was $23,750,000, and of imports $26,850,000. The head of the immediate government is the native bey, who rules under French protection. The capital is Tunis. The population is of a very mixed character, containing, besides the Moors, traces of the ancient Numidian, Phœnician and Roman elements. The total population is about

1,906,000. In 1918 there were 48,000 French and 130,000 other foreigners, including 112,000 Italians. Tunis was a part of the ancient Carthaginian dominion, and afterward of the Roman province of Africa. In the latter part of the 7th century it was taken by the Arabs, and in 1575 it came under Turkish suzerainty. In 1881 France invaded Tunis under pretext of punishing the Krumir marauders. As a result of the invasion the bey was forced to sign the treaty making the state a French protectorate.

Education.— There are about 287 public schools, eight lycées and colleges and 23 private schools. There are 30,767 pupils of whom 18,731 are boys. Of all pupils, 7,025 are French, 9,639 Mussulman; 4,870 Jews, 9,639 Italian; 1,570 Maltese and 280 others. In the Great Mosque at Tunis there is a Mohammedan university. In the city are 86 and in the interior 1,214 Mussulman primary schools, some of which receive state-aid.

Government.— The government is carried on under the direction of the French Foreign Office, which has a special department for Tunisian affairs, under the control of a French Minister Resident-General, who is also Tunisian Minister of Foreign Affairs, and a ministry of 10 heads of departments, eight of whom are French. French tribunals take cognizance of cases between Europeans and between Europeans and Tunisians, and there are native courts for cases between natives.

Finance.— The 1916 revenues aggregated $12,843,245, made up from direct taxation $2,278,845, indirect taxation $3,878,180, monopolies (tobacco, etc.) $4,384,385, post office, telegraphs, etc., $607,095 and royalties, etc., $1,694,740. In the same year the disbursements amounted to $12,283,945, for the civil list the residency and district services, public debt charges, the various government departments and the army. The public debt is about $450,000,000.

Communications.— About 2,000,000 tons of shipping enter and clear annually at Tunisian ports. About 37,962 miles of good roads have been constructed within the last 30 years. There are in operation 1,535 miles of railway, 3,721 miles of telegraphs, 254 telegraph offices, which handle annually about 1,700,000 messages. There are 724 miles of urban telephone lines and interurban systems with 2,717 miles of wire. There are 456 post offices, which in 1916 handled 41,077,660 letters in the internal service, and 71,111,196 in the external service.

Defense.— There is an army of occupation maintained by France, and having an average strength of 17,000 to 18,000, with 600 officers. There are a few native regiments (*spahis*, etc.) included in this force. In the Great War 1914–18 about 35,000 Tunisian troops served under the tricolor in France.

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TUNIS, North Africa, the capital of the French protectorate of Tunis, situated in the northeastern corner of the country, at the western extremity of a shallow salt lagoon connected with the Bay of Tunis by a narrow channel at the port of Goletta. A canal, six and one-half miles long and 22 feet deep, has been dredged through this lagoon to Tunis. There is a good water supply provided by rebuilding an ancient aqueduct. The interior of Tunis presents generally a labyrinth of narrow dirty streets; but great changes have taken place since the French occupation, a European quarter with fine buildings, including the French residency, the public offices, Roman Catholic cathedral, etc., having arisen. Besides the colleges, there are good hospitals and a large asylum for the aged, maintained by the Little Sisters of the Poor. Among the most interesting native buildings are the bey's palace and the mosques. The city has considerable manufactures of silk and woolen goods, shawls, mantles and jewelry. There is now regular steam communication with Europe and the ports of Algeria, and a railway runs to Algiers. The ruins of ancient Carthage lie about 10 miles to the northeast of Tunis, and may be reached by railway. Pop. about 164,606 Moslems, 43,000 Jews, 70,000 Italians, French, etc; total, 277,606.

TUNKERS. See DUNKARDS; GERMAN BAPTIST BRETHREN.

TUNKHANNOCK, Pa., county-seat of Wyoming County, on the Susquehanna River and the Tunkhannock Creek, and the Lehigh Railroad. It is 30 miles northwest of Wilkes-Barre. Lumbering is carried on extensively, and the chief industries are tanning, spool and tub factories, stave and planning mills and furnaces and machine shops. There also are witchhazel distilleries. Pop. about 1,800.

TUNNELS, Great Modern. The completion of the boring of the Simplon tunnel on 24 Feb. 1905, thus assuring of its being opened to travel during the latter part of that year, marked the culmination of one of the greatest events in civil engineering during the last decade, and the successful termination of the greatest tunnel boring enterprise of any age, ancient or modern.

At the present time, four great tunnels pierce the great Alpine barrier between northern and southern Europe. The Mont Cenis and the Saint Gotthard connect France and Italy; the Arlberg places Austria in communication with Italy, while the Simplon forms a direct connection between Italy and Switzerland, bringing Geneva and French Switzerland into closer communication with Milan and the Adriatic railways. It also shortens the distance from Calais to Milan by 95 miles, as compared with the Mont Cenis route, and by 80 miles over the route passing through the Saint Gotthard.

The feasibility of a transalpine tunnel was contemplated about the middle of the 19th century, and work was begun on the Mont Cenis tunnel in 1857, at a point near Modane in France, from which it passes under the elevation, Col de Frejus, about 18 miles west of Mont Cenis, and emerges into Italian territory

at a point near Bardonecchia, 24 miles from Susa. The exact length of the tunnel between portals is 7.6016 miles, but as the railway, instead of entering the tunnel at the portals, joins it through special curved sections at each end, the total length of the borings amounts to about eight miles. It was bored simultaneously from both ends on a rising gradient, with its summit at the middle point. The grade from Modane is about 1 in 2,000. The rock formation traversed as the boring advanced southward from Modane was characterized by carbonaceous schist 1.3027, quartz 0.2414, limestone 0.2210, and calcareous schist 2.0357 miles; while the entire distance traversed from the Bardonecchia end to the summit amounting to 3.800 miles, was through calcareous schist. The altitude of the tunnel is about 4,248 feet above sea-level, and 5,428 feet below the crest of the mountain. At the Modane end the tunnel is 25 feet 3½ inches wide at the bottom, 26 feet 2¾ inches at the point of maximum breadth; semi-circular in form, and 24 feet 7½ inches in height. At the Bardonecchia portal, an elliptical arch is introduced to resist the greater strain caused by the different inclination of the strata, and the height is 11¾ inches greater than that of the Modane section. The side walls are eight feet six inches in thickness throughout the entire length of the tunnel, and with the exception of 300 yards on the north side, are lined with brick and stone, while the side paths are paved with flagstones 20 inches in width. During the first three years, the operations consisted of hand labor exclusively, but in 1861 and 1862 power drills were installed at the Bardonecchia and Modane ends, respectively. The drills employed were designed by Sommeiller, the chief engineer. They were of the percussion type, the operative power being compressed air. Gas factories and machine shops were installed at each end. During the boring process, many springs were tapped, the water from which found an outlet through the tunnel. This water was finally utilized to furnish the power for the air compressors operating the drills — the Italian engineer profiting by the suggestion of the invention by Bartlett in 1855, of a rock drill operated by air compressed by a steam engine. The air compressing apparatus was installed at the Italian end, the compression approximating six atmospheres, derived from the hydraulic pressure from mountain streams and the water from the tapped springs. The same apparatus supplied fresh air at the rate of 2,000 cubic feet per minute, while the ventilation was accomplished partly by the atmospheric drills, and partly by special ventilating pipes eight inches in diameter, the blowers and exhausting bells being operated by powerful turbines. Gunpowder was exclusively used in the blasting operations, the charges being fired by a magneto-electric apparatus in front of a movable bulkhead, which was advanced as the work progressed, the detritus being subsequently removed by hand, by gangs of men 900 feet apart, working on scaffolds at various heights. The hauling was accomplished by horses and small trucks. The credit of the work belongs to the three Italian engineers, Sommeiller, Grandis and Grattoni, whose genius surmounted the many obstacles which daily confronted its advance. The boring of the tunnel was finished in 1870, and it was opened to traffic in 1872, equipped with a double-track railway and cost $1,100 per linear yard, a total expenditure of $15,000,000, and required 13½ years for the accomplishment of an engineering task, which was the greatest in its time. The entire undertaking was financed by the Sardinian government. It is an example of tunnel construction by the drift method.

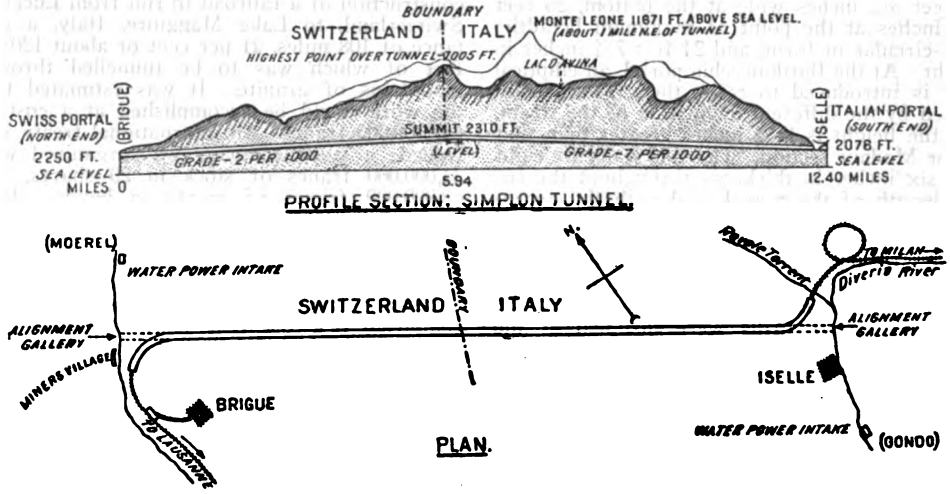
Immediately following the opening of the "Mont Cenis" for travel in 1872, a work of much greater magnitude was undertaken not only to make another connection beween France and Italy, but to connect the North Sea ports with those of the Mediterranean; those of Belgium, Holland and Germany, with Genoa; and the Valley of the Rhine with that of the Po. The enterprise was too great for private industry or capital, therefore, in 1871 Italy, Germany and Switzerland voted large subsidies for the construction of a railroad to run from Lucerne, Switzerland, to Lake Maggiore, Italy, a distance of 108 miles, 21 per cent or about 120,000 feet of which was to be tunnelled through mountains of granite. It was estimated that the work could be accomplished at a cost of 187,000,000 francs. An international treaty was signed; a stock company was organized with 34,000,000 francs of stock in 20 shares, and 68,000,000 francs of mortgage bonds. Italy gave 45,000,000 francs, and Germany and Switzerland each 20,000,000 francs. This estimate, however, was found to be too low by 102,000,000 francs, and caused a great many unnecessary delays in the work, which was finally completed at a cost of 289,000,000 francs ($57,800,000), of which $11,500,000 was expended on the Saint Gotthard tunnel alone, the location for which in spite of many undesirable topographical conditions was selected at the most central point of the Alpine range, on account of the directness of the route thus obtained. The northern portal is situated near the little village of Goeschenen in the canton of Uri, Switzerland, from which the axis of the tunnel passes through the range under the lofty peak known as Col de Saint Gotthard, and emerges from its southern portal near Airolo in the canton of Tessin, Italy, after traversing a direct distance of nine and one-quarter miles, and forms a part of the railway from Lucerne to Chiasso.

Unlike the case of its predecessor, the Mont Cenis, the tracing of its axis was beset by a great many difficulties, due to adverse topographical conditions. The axis of the Mont Cenis was traced under the mountains by means of three astronomical observatories, one being established at a high elevation and equipped with a telescope that revolved in the vertical plane passing through the axis of the tunnel. From this station the position of the other two observatories were determined toward the entrances, their telescopes placed in the same vertical plane, and the direction of the axis supplied to them whenever necessary. The direction of the Saint Gotthard was determined by careful triangulation; the fine topographic maps of Switzerland forming an important and valuable adjunct to the operations. Owing to the great elevation at which the tunnel was driven, that of the north and south portals being respectively 3,639 feet, and 3,757 feet above sea-

level, seven sets of helical or spiral tunnels, four on the Italian, between Giornico and Fiesso and three on the Swiss side, were constructed to bring the railway up to the great elevations of the portals. This system, designed by Hellwag, the engineer-in-chief, comprised a series of 100 tunnels in all, some of which are 6,000 feet or more in length, making the total distance tunneled slightly less than 23 miles. Under these conditions, the trains enter the foot of the mountains and by winding about through the spirals within its bowels, emerge along its sides a couple of hundred feet higher up at each lift until the entrance to the main tunnel is reached. The travelers are thus afforded successive views of the magnificent Alpine scenery from various altitudes, passing within a few hundred yards of Rutli, Bürglen, Altdorf and other spots made famous by William Tell, and

ally. The force of laborers numbered 3,500 all Italians, while the officers were Swiss and Germans. The men were paid from three to six francs per day of eight hours' work, and had to board themselves. Under these circumstances the poor food with which they supplied themselves contributed greatly toward the enormous death rate. Favre (Swiss) was the head of the firm of contractors. The cross section dimensions of the boring is similar to that of the Mont Cenis, and is lined throughout with masonry 18 to 20 inches in thickness. It is equipped with a double-track railway, and required nine and one-half years of labor for its construction, which was commenced in 1872 and completed in 1882.

The third great Alpine tunnel, the «Arlberg,» forms a part of the Austrian railway between Innsbruck and Bludenz in Tyrol, which con-



through the intricacies of the rugged Axenstrasse. Salient facts relative to the construction of this tremendous piece of engineering may be briefly stated as follows: The work was prosecuted under the Belgian system, main heading; rock drills being operated and ventilation accomplished by water power exclusively. At the Swiss end, 1,220 horse power was derived from the Reuss River by means of four horizontal impulse turbines, and at the Italian end, 1,220 horse power, from the combined heads of the Tessin and Tremola rivers, by means of six turbines of the same type. These turbines working in pairs, drove groups of Colladon air compressors, which supplied 1,000 cubic yards of air per hour at a compression of seven to eight atmospheres, equal to 100 horse power, delivered at the drills, which, when exhausted, equaled 8,000 cubic yards of fresh air per hour. Dynamite was exclusively used in the blasting operations, being considered cheaper and safer than nitroglycerine. At first the arrangements for ventilation were very inadequate, and combined with a lack of proper sanitary and hygienic regulations, resulted in a great loss of life. The application of the injector system of ventilation, invented by Signor Saccardo, engineer of Bologna, rectified these conditions materi-

nects westward with the Swiss railroads, and southward with those of Italy. It penetrates the Alpine watershed between the Rhine and the Danube, from Saint Anton to Langen, a distance of 10.25 kilometers, about six and one-third miles, its axis passing 1,594 feet under Arlberg Pass. The eastern and western portals are respectively 4,277 feet and 3,985 feet above sea-level, with the summit at an elevation of 4,301 feet. Its construction was begun in 1880 and completed in 1883, at a cost of $7,500,000. Passenger trains pass through the tunnel in about 25 minutes.

Many schemes to connect Switzerland and Italy by a railway near the Simplon Pass had been in contemplation for several years. In 1881 the Jura-Simplon Railway advanced the scheme of piercing the Alpine barrier by a tunnel, which entering the base of Monte Leone at a short distance above Brigue, situated on the Switzerland side, on the left bank of the Rhone, and passing under the lofty mountain range, would emerge at Iselle on the Italian side, the distance to be traversed being somewhat over 12 miles. Since the days of the Roman Empire, the Simplon Pass has been the trade route between Milan and the flourishing cities of the Valley of the Rhone. For more than 2,300 years it was the great highway of trade and travel

between southern and northwestern Europe. Over it, Hannibal led the conquering armies of Carthage, and, later, Cæsar his legions, when he laid the foundations of the Roman Empire. In modern times the Jura-Simplon Railway has run its trains along the same route, although laboring under the almost prohibitory difficulties of excessive grades and the long distance compelled by the ruggedness of the rock formation on the Swiss side of the frontier. The Swiss and Italian governments considered the scheme proposed by the Jura-Simplon Railway Company favorably and undertook its financing jointly. The Swiss government entrusted the work of construction to the Baugesellschaft fuer Simplon-tunnel, Brandt Brandau and Company extending to it a credit of $13,000,000, stipulating that the entire work should be completed in five and one-half years, the limiting date being stated as 21 May 1904. For each day that the work was finished prior to that date the company was to receive a premium of $1,000, and for each day of delay subsequent to that date it was to be fined a similar amount. The price named, however, was greatly exceeded, the actual cost finally amounting to $15,700,000; the additional payment and the extension of time for completion being agreed to by the governments interested, on national grounds as well as in due recognition of the many unexpected difficulties that confronted the contractors and caused unavoidable delays. For example, although the advancement of the tunnel averaged between 500 and 700 feet per month, an advance of only 50 feet was made during the first three months of 1902, the work being retarded by the tapping of many springs and by the occurrence of numerous rock-slips.

The first blast in the work of boring was fired 21 Nov. 1898, the operations being carried on simultaneously at both the Swiss and Italian ends. In order to avoid the excessive freight rates compelled by the expensive operation of the traffic over the inclines of the Saint Gotthard, as well as for the purpose of making it an express route operating fast-train service, the altitude of the tunnel was kept as low as possible, although it might have been driven at a much higher level with an enormous saving in the cost. The Swiss end has an altitude of 2,250 feet and the Italian end 2,076 feet above sea-level, while the summit of the tunnel, where the ascending gradients from each end meet, has an altitude of 2,310 feet.

This tunnel, unlike the other transalpine borings, which are single passages equipped with double tracks, consists of two parallel tubes or twin passages, each 16½ feet wide, separated by a distance of 55.7 feet between their axes, each passage being equipped with a single track, thus permitting of travel in both directions at the same time. It is straight throughout its entire length with the exception of a short curve at each extremity, so that the new railway running from Brigue and gently ascending the valley of the Rhone for a distance of one and one-fourth miles, enters the tunnel on a right curve of 1,050 feet radius. The straight portion of the tunnel begins at a distance of about 460 feet from the entrance, extends a distance of 12¼ miles, at an obtuse angle with the Rhone Valley in Switzerland and the Val Vedro in Italy, and emerges on a left curve of 1,311 feet radius, above the banks of the Diveria River, on the Italian side. It has rising gradients of two per 1,000 from the Swiss side and seven per 1,000 from the Italian entrance, the summit of the tunnel or the meeting point of the gradients being at a distance of 5.944 miles from Brigue, at an altitude of about 2,310 feet above the level of the sea, and about 7,000 feet below the crest of the mountain between the Furggenbaumhorn and the Wasenhorn. The two passages are connected by transverse galleries or cross-headings at intervals of 660 feet, thus facilitating ventilation and problems of transportation. At the summit the transverse gallery is excavated to double width and affords room for the central station located at that point.

The working force numbered 1,000 men, divided into three shifts on the eight-hour basis, so that the work was carried on continuously day and night during the entire period of over six years. These laborers were all Italians, the Swiss having no adaptability to the work of blasting rocks and removing debris, thousands of feet below the snow-capped mountain ranges or the verdant hills upon which they tended their herds and crops. This small army of workmen was comfortably located in well-arranged quarters which were erected across the river near the Swiss portal, and every necessary precaution was taken to protect their health and keep them in a fitting condition to prosecute their labors. The many fatalities consequent to a lack of these precautions in the construction of the Saint Gotthard afforded an example by which the Simplon management profited greatly. At the Swiss end they established a fine hospital with facilities for treating emergency and contagious cases. Sanitary and hygienic regulations were strictly enforced. When a shift of laborers was relieved and came out of the hot workings in the tunnel, each man was required to take a bath at once, before being exposed to the keen Alpine atmosphere, and he was required to hang his damp working clothes in a drying room, and put on another suit while he was off work. As the Simplon boring was executed at a depth ranging from 5,000 to 7,000 feet below the surface of the mountains, about 50 per cent deeper than had ever been required previously, the engineers were compelled to devise means to ameliorate the resulting conditions of torridity, in which the temperature frequently rose to 110° F. These conditions were modified by pumping cold water from the outside into the boring through pipes pierced with small holes, so that the water fell upon the laborers like a fine rain or drizzle, and through this liquid veil the fresh air was forced and cooled to a bearable temperature. The general refrigeration was effected by means of 34,118 feet of 9.96 inch piping from each end, connected to four refrigerating appliances of 71 heads and 11 jet sprays placed at intervals along the boring, so that the spray would bathe all the sides of the headings in the neighborhood of rock heated to a temperature by infiltration from hot springs, the waters of which were of a parboiling temperature and often exceeded 112° F. The plan of carrying away the hot water to some point where its effect would not cause the same local inconvenience was uniformly pursued, but only partially prevented the heating of the air, although the greatest care was

taken to insulate the pipes both from hot and cold radiations. Ventilation was accomplished with the aid of the auxiliary tunnel, No. 1. It is to be understood that of the twin passages, the one designated as No. 2 was completed first, that is, enlarged from the heading to its ultimate dimensions, passage No. 1, at first being carried on with much smaller dimensions, and forming an important adjunct in the system of ventilation. The compressed air for this purpose and for operating the compressed air locomotives was carried through tunnel No. 1, to the headings through pipes varying from 1.18 to 1.97 inches in diameter; air valves on the main at various points enabling the recharging of the locomotives. When the heading face was some distance in advance of one of the transverse galleries cool air was supplied to a nearby point through a light sheet-iron pipe carried immediately below the roof of the heading. At intervals a connection was formed between the hydraulic pressure main running along the floor of the heading, so that a jet of air was forced into the overhead pipe under a pressure of about 78 atmospheres, inducing a strong current in the pipe which was conducted right up to the face. The water was collected in and drained off a number of siphons placed at intervals along the air main. During the last two years of the work compressed air locomotives were exclusively used at the Swiss end as the use of horses for switching the spoil trucks at the headings was made impossible by the heat of the tunnel. An important feature of the entire work was the fact that no possible advantage that could be derived from transported hydraulic force was neglected. The water discharged from the tunnel from tapped hot springs and infiltrations amounting to 50 or 60 gallons per second was utilized to operate the ventilator turbines, as also the return water pumped into the tunnel for power to drive the rotary drills and for purposes of refrigeration.

The rock-boring work was accomplished with an hydraulic perforator, a machine consisting of a hollow steel stem, two and three-fourths-inches diameter, carrying on its end the three tempered cutting points. It was operated by a hydraulic engine with a pump pressure ranging from 80 to 120 atmospheres, representing an available force of 22,000 to 26,000 pounds. During operation water was constantly forced through the hollow stem, and while washing away the débris tended to keep the teeth cool. The teeth biting into the rock wore it away at the rate of about one-third an inch per revolution, the number of revolutions varying from four to eight per minute according to the hardness of the rock. From 10 to 12 machines were in operation at each end of the tunnel from the start. When the drills had penetrated to the depth of about five feet they were withdrawn, the dynamite was inserted and fired and the spoil cleared away.

Perhaps the greatest of all of the difficulties encountered in the prosecution of this work was the influxes of hot water, first on the Swiss and later on the Italian side. Professor Schardt, the official geologist, estimated that the tunnel discharged one billion cubic feet of water during its construction. At times the boiling springs tapped converted the boring into a veritable canal, forcing a suspension of operations for months at a time, until the water was gotten under control, pumped out and the walls of the tunnel sufficiently cooled by sprays of ice-water to allow the men to resume work. Even then they had to be sprinkled constantly with ice water to enable them to withstand the deadly temperatures. These conditions forced the abandonment of the operations on the Swiss side at a point about six miles distant from the entrance, the necessity for the suspension of operations being materially augmented by a landslide which occurred at Moerel, a point on the Rhone, a short distance above the intake of head-water which supplied the hydraulic force for the power station at Brigue. The work was then carried on from the Italian end and advanced regularly at the rate of about 16½ feet per day, until 6 Sept. 1904, when a gigantic boiling spring was tapped which discharged into the tunnel a stream of water with a temperature of 113° F. at the rate of 1,600 gallons per minute. The rock temperature was forced up to 108° F., and the work had to be stopped until a transverse gallery could be constructed to join the two southern passages so as to allow the hot water to flow out of the main passage through a lateral canal along its walls. The temperature was cooled by jets of ice cold water, and after a delay of three months, during which the work of enlargement was accomplished, the heading was pushed forward resulting in a junction of the northern and southern tunnels 24 Feb. 1905, allowing the immense volume of water which had accumulated in the headings of the abandoned north tunnels to flow down through the main south tunnel into the Diveria River.

The machinery installed at both ends of the tunnel was mainly of European manufacture. It consisted of four-stage high-lift centrifugal pumps and hydraulic turbines at the power stations, centrifugal pumps driven by Pelton wheels in the swamped portions of the tunnels; duplicate 12¼-foot ventilating fans, which will continue to serve all the requirements of the tunnel under operative conditions, driven by two 200 horse-power hydraulic turbines. High-pressure plunger pumps in connection with the hydraulic accumulators, each pair of pumps being driven by a Pelton wheel, supplied cold water to 16 Brandt hydraulic borers working at both ends of the tunnel, four at each heading face. The high-lift refrigerating centrifugal pumps were run in series at 950 revolutions per minute, under a pressure of 370 pounds per square inch and supplied water to the refrigerating plant at the rate of 18.21 gallons per second. The refrigerating conduit also furnished power for four ejector pumps and six portable fountain heads located in the traversing galleries. In the beginning steam locomotives were employed for hauling, and steam engines were kept in reserve to be used in case of the failure of the water power; but as the work advanced compressed air locomotives were used exclusively at both ends of the borings. The air compressors had a capacity of two and three cubic meters of free air per minute and compressed air into a reservoir of the tubular battery type. The machinery installations at both ends of the tunnel were identical.

A very clear idea of the difference in the amount of time and labor consumed in the bor-

ing of ancient and modern tunnels may be obtained by comparing the Roman tunnel bored for the purpose of draining Lake Fucino with the Simplon. The former, begun in the reign of Julius Cæsar, was completed during that of Claudius 52 A.D. It was three and one-half miles long and passed under the Palatine at a maximum depth of 400 feet. Its construction involved the sinking of 40 vertical shafts and many inclined galleries, requiring the labor of 30,000 men during a period of 11 years. It was the most celebrated work of its kind at that time and still remains in an almost perfect state of preservation.

On the other hand, the Simplon tunnel with its twin passages 12¼ miles in length, repreesening 24½ miles of boring, at a depth often exceeding one and one-quarter miles below the surface, required the labor of 1,000 men during a period of about six and one-half years. The Fucino tunnel has a normal cross section 10 feet high by 6 feet wide; with the appliances used in the work of the "Simplon" it could have been easily bored in six months.

Another important European tunnel was completed in 1916 despite the war. It is known as the Rove tunnel and runs from l'Estaque, France, to make way for a canal from Marseilles to the Rhone River. It is four and one-half miles long, 72 feet wide and 47 feet high, and it is wonderful that the French were able to complete it at such a time.

In 1906 work was begun on a tunnel under the Loetschen Pass from Bern to Brig, Switzerland. It is nine miles long and was opened in the summer of 1913. Other long Swiss tunnels are those at Côte d'Or, begun in 1915, and the Jura tunnel between Munster and Grenchen, the latter five and five-eigths miles.

The only American tunnel previous to 1900 comparable to the transalpine borings already described is the Hoosac tunnel on the line of the Fitchburg Railroad, between Troy, N. Y., and Greenfield, Mass. It is driven through a southern spur of the Green Mountain range, known as Hoosac Mountain, and is 25,037 feet (four and three-fourths) miles in length. Its construction was begun in 1855 and completed in 1873, the masonry work requiring several additional years. During this period the work was suspended many times on account of a lack of funds and the natural obstacles encountered. Where the rock is solid, it is 20 feet high and 24 feet wide, but wherever arching was necessary these dimensions are somewhat greater. The work was carried on by four headings, one from each end and two from an intermediate shaft 1,028 feet in depth; modern tunnel boring methods, involving the use of electricity, nitro-glycerine, air compressors and power rock drills and marking their first introduction in America. It has an ascending gradient of 26 4/10 to the mile, is equipped with a double railway track and cost a little less than $11,000,000. Slightly longer is the Rogers Pass tunnel (26,400 feet) on the Canadian Pacific Railway in the Selkirk Mountains of British Columbia. It is 24 by 29 feet, concrete lined. What will be the longest American tunnel is the Continental Divide, being cut under the Rockies for the Denver and Salt Lake Railroad, six and one-half miles in length. The longest up to the date of opening (1909) was the Gunnison in southwestern Colorado, six miles in length.

The lengths of some of the other important mountain tunnels in various parts of the world are as follows: the "Giovi" on the Genoa-Ronco Railway, 8,260 meters (about five and one-sixth miles); the "Marianopoli," on the railway from Catania to Palermo, in Sicily, 6,840 meters (about four and one-quarter miles); the "Sutro" in Nevada, 6,000 meters (about three and three-fourths miles); the "Standridge," between London and Birmingham, 4,970 meters (a little more than three miles); the "Nerthe," between Marseilles and Avignon, 4,620 meters (a little more than two and three-fourths miles); the "Pracchia Tunnel," on the main railway line between Florence and Bologna, through the Apennines, comprising 52 tunnels with heavy gradients — 25 per 1,000 throughout, the several tunnels varying in length from 3,000, 6,000 to 9,000 feet, characterized by very poor ventilation, which was finally improved by adopting the Saccardo system, which was here applied practically for the first time. The "Bilbo" in Italy, 4,240 meters (a little over two and one-half miles); the "Kaiser Wilhelm," on the Moselle Railway, near Kochem, 4,220 meters (it is the longest tunnel in Germany); the "Blaisy," on the railway from Paris to Lyons, 4,100 meters (two and one-half miles); the "Stampede," on the Northern Pacific Railway, 9,850 feet, and the "Cascade," on the Great Northern Railroad, 13,413 feet in length, through the Cascade Mountains in the State of Washington. The construction of the former was begun in 1886 and completed in 1888; that of the latter covering the period between 1897 and 1900, the cost of each being about $1,250,000. Both of these tunnels pierce the mountains at a considerable elevation, about 3,000 feet above sea-level, but are surpassed in this particular, and the technical difficulties of construction encountered, by those of the transandean railways, the most notable of which was opened in 1892, on the Peruvian Central Railway, running from Callao to the Pacific Ocean, thence by way of Lima to Oroya on the eastern slope of the Cordilleras. This line after passing the station Sureo on the Chalappa Viaduct at an elevation of 6,650 feet overcomes the great topographical difficulties of the Matacana Valley and passes through the tunnel, 3,596 feet long, at a height of 15,781 feet above sea-level — an elevation equal to that of Mont Blanc, the highest peak of the Alps — in a region of perpetual snow, 104 miles from Callao. Another one, 15,880 feet in length and forming a part of the railway between Buenos Ayres, Argentina and Santiago, Chile, pierces the Andean range at an elevation of 10,500 feet above the sea. In 1910 another transandean tunnel was completed, connecting Valparaiso and Buenos Ayres and cutting the mountains at an elevation of 10,000 feet. Australasia has but one remarkable tunnel, that at Otira, New Zealand, five miles in length.

The most notable of the many other examples of mountain tunnels are: the "Stone Mountain Tunnel," at Gibraltar, a series of galleries three miles long, pierced for cannon at intervals of 12 yards and having guns of large calibre already mounted in 1,000 of these embrasures. The "Joseph II Mining Adit," forming the main efflux gallery of the metal and

sulphur mines at Schemnitz, Hungary. It was begun in 1782, the time required for construction being estimated at 30 years and the cost at 1,215,000 florins. The progress of the work, however, suffered a great many delays and it was not completed until 1878, the total expenditure amounting to 4,599,000 florins. It is 9 feet 10 inches high, five feet two inches wide and is the longest mining tunnel in the world, having a length of 10¼ miles. The «Kojak,» forming a part of the Northwestern State Railway of India, about two and one-half miles long, and completed in 1891. The «Tequixquiac,» a boring 14 feet in diameter, driven through sandstone for the purpose of draining the Valley of Mexico. It is six miles long and cost $6,760,000. The drainage works designed to improve the sanitary condition of the City of Mexico and prevent the inundation of its streets, for long periods at a time, by the overflow from Lake Texcoco and the consequent loss of thousands of lives, were begun during the latter part of the 16th century. Up to 1789 the work was of an intermittent character, cost many thousands of lives and many millions of dollars. From 1789 to 1830 the effort was more sustained and systematic but, although $8,000,000 had been expended, and the city protected from the inundations, its position in the bottom of a basin without natural drainage, with the artificial drainage canal inadequate in depth owing to its being controlled by the level of the lake which was but slightly lower than that of the city, continued to keep it subject to virulent epidemics of malaria. The new works, gigantic in character and ranking with the greatest of modern engineering accomplishments, were begun in 1885 and completed in 1900, with a total expenditure of $20,000,000. These works consist of a complete sewerage system within the city; a system of sewers to control the overflow of the entire valley; a canal 43 miles long, connected with the sewerage system, at the Saint Lazaro gates, by which the sewage of the city, its waste waters and the waters of the valley are conducted to the tunnel, thence to a river emptying into the Gulf of Mexico.

The «Graveholz,» on the Bergen Railway in Norway, about three and one-third miles in length, and the Yanagase Zama forming a part of the Tsuruga-Nagahama Railway in Japan.

Two London river tunnels deserve mention. The Blackwell tunnel under the Thames is a mile and a quarter in length, but only 3,088 feet are under the river, 1,370 feet are roofed over and the remainder of the length is composed of the open-cut entrances. It was driven with a 28-foot shield and built of great cast-iron rings steadied with cement. The Rotherhithe under the Thames is about the same size.

New York River Tunnels.— This article would not be complete without reference to the great under-water tunnels constructed around Manhattan Island during the opening years of the century. The greater part of New York city lies on Manhattan Island and to afford easier railway communication from all sides a series of very difficult under-river tubes was planned and built. The four largest were built by the Pennsylvania Railroad Company, to bring its traffic into New York from Jersey City and to carry it over the East River to Long Island. The Hudson and Manhattan Railroad system built four under the Hudson for passenger communication between New Jersey and New York, affording an outlet for the passengers of the Lackawanna and Erie railways and also for Pennsylvania passengers from Newark and local points. The pair of Belmont tunnels was constructed to connect Long Island City with New York and open up Queens County to development. The Rapid Transit tunnels run from the Battery in Manhattan to Joralemon street, Brooklyn. Two other pairs of tunnels are under construction to join Manhattan and Brooklyn. No other great city was ever so thoroughly honeycombed by tunnels. See NEW YORK CITY; TUNNELS, RIVER AND LAKE.

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TUNNELS, River and Lake. Hudson-Manhattan Tunnels.— These are frequently termed the McAdoo tunnels. They consist of two separate sections of sub-aqueous tubes: (1) The twin tubes which run from the Hoboken, N. J., terminus of the Delaware, Lackawanna and Western Railroad crossing the Hudson River to below Christopher street, New York City, and running to 6th avenue, thence uptown to 32d street. (2) A pair of tunnels driven from the terminal of the Pennsylvania Railroad in Jersey City across the Hudson, entering New York City at Cortland street.

Haskins Tunnel.— The early history of the up-town twin-tunnels under the Hudson River is a tragic one. D. C. Haskins, a westerner of wealth, conceived the idea that the Hudson River could be crossed by a tunnel formed by boring in the bed of silt deep below the surface, maintaining an air pressure in the heading equal to the hydrostatic head outside and retaining the excavated space by insertion of a series of iron rings as fast as the boring progressed. Work was commenced in 1874 from the New Jersey side; it was the first attempt to tunnel the Hudson River. A shaft was sunk to 54 feet below mean high water, an air lock was built and the regular tunneling began with an air pressure of about 18 pounds at the shaft, increasing to 36 pounds at 1,600 feet distance. After carrying this north heading a quarter of a mile, the south tunnel was started. Then the New York end was commenced with sinking a timber caisson to a depth of 56 feet below high water. Blow-outs occurred with flooding and letting in of silt, which ended in a serious blow-out in 1880, cutting off the escape of the

excavating crew and drowning 20, thereby ending operations. In 1888 S. Pearson and Son of England took up the contract, and the shield method of driving was used, but financial troubles closed out operations till 1902, when the plant and franchise were acquired by the New York and New Jersey Railroad Company, who renewed the effort. In 1905 the Hudson Company obtained the tunnel interests and the operation became part of what is known as the McAdoo System.

McAdoo Tunnels.— With the amalgamation of the New Jersey Railroad Company and the Hudson-Manhattan Railroad Company in 1903, the McAdoo System started in operation. Leaving out consideration of the great terminal and other works, the great tunneling feat alone is featured here. The overcoming of the many very difficult engineering problems was placed under the management of Charles M. Jacobs and J. Vipond Davies, and they determined on the employment of compressed air as a medium for operating drills, shields and all mechanism used in construction. On the Jersey City side the former shield service was used with certain necessary changes, such as heavy hood or apron to protect the workers. Pressure of 33 pounds was carried, as the upper stratum of the tunnel was of silt. Blow-outs were closed with clay blankets supplied from scows waiting in readiness. The shield was driven by hydraulic jacks with 2,500 tons aggregate thrust to make passage through the silt, thus making excavation unnecessary. A rock reef at one time was struck that reached 16 feet above the bottom of the space to be tunneled, the upper part being of clay so fluid as to slip into the pockets of the shield. Gigantic blow-pipes supplied with fuel from tanks of kerosene were used to bake the clay to sufficient hardness as to permit the excavators to work on the rock beneath. The tunnel diameter of 15 feet 3 inches was lined with cast-iron plates bolted together in circular section. The greatest engineering feat in this great undertaking was the construction of the tunnels at the junction of the Christopher street, 9th street and 6th avenue, New York City. At this point two tunnels run east under 9th street and two north under 6th avenue. Overhead here were the surface car lines of the Metropolitan Street Railway, and above this the Elevated railroad, both in operation. An arch, to accommodate two tubes approaching from the south and four tubes diverging east and north had to be constructed with 68 feet maximum width, and the soil was a "running sand." The enormous difficulty was overcome by constructing two iron-lined temporary tunnels and the side walls being built in. Then, through openings on top of the tunnels, heavy false work was constructed strong enough to permit springing the arch. The temporary tunnels were then eliminated. Any accidental disturbance of the timbering meant that the surface lines and Elevated structure must fall into the excavation. Tunnels from Jersey City to Morton street, New York City, started 1874, opened for traffic 1908, consisting of two single-track tubes 5,000 feet long with minimum diameter 15 feet 3 inches. The two down tunnels connecting Jersey City with Cortland, Church and Fulton streets, New York City, were commenced in 1905 and opened for traffic operation in 1909. These consist of two tubes 5,950 feet long and 15 feet 3 inches inside diameter. As to the land sections of the Hudson-Manhattan tunnels, one connects, by two single-track tubes, the Hoboken terminal with the Jersey City Pennsylvania Railroad station, running parallel with the Hudson River. This was completed in 1911. Another land subway connection runs from Morton and Christopher streets to connect with 33d street, running along 6th avenue. This was opened to the public in 1910 and was constructed with shield to 12th street, then cut-and-cover to 33d street.

Cleveland Water Works Tunnels.— This tunnel is under Lake Erie and is a three-mile sub-aqueous tunnel driven by hydrualic shield and lined with concrete blocks. The character of the soft ground permitted a speed of 886 feet in one heading. The soil met with was stiff clay, free from runs. But accumulations of marsh-gas made hazards of explosions equal to those in coal-mining, and necessitated coal-mine methods of precaution. The land heading carried the longest continuous compressed-air section recorded — 14,000 feet finally. Irregularities in advancing the shield (due to inadequate survey force) took the workers 180 feet out of alignment and out of grade line 6 feet above and below. When the two headings were approaching to about 1,500 feet of each other an expert survey was made and a "reverse curve" course was made to get the junction. The tunnel diameter is 10 feet inside, its length 16,088 feet and it runs 100 to 110 feet below the level of the lake with a gradient of about 10 feet. There is a roof crust of 50 to 70 feet between tunnel and lake bottom. The clay, though stiff, did not permit working without air pressure and 20 pounds was the average carried. The shield used was a simple riveted-steel double ring structure free from interior partitions and diaphragm. It was furnished with a cast steel cutting edge of usual type and was without hood. Its length in all was 15 feet 1 inch with diameter 12 feet 2⅛ inches. A dozen jacks with 9-inch plungers drove it forward using 1,500 to 3,000 pounds pressure per square inch. The work started with excavation by means of a rotary cutting machine, which was, however, discarded in favor of hand work for half the tunnel because of changed character of the soil. The chief innovation in this tunnel is the block lining substituting bricks used in other Cleveland intake tunnels. The blocks used were the Parmley variety of patent concrete for the first 2,500 feet of land-heading, then a block designed by the city's own engineers. The latter did away with the cast-iron segments customary, thereby reducing cost. The lining is 11½ inches thick. The headings met in December 1916.

Astoria Gas Tunnel.— This New York tunnel is 4,262 feet long. It extends from the Astoria plant of the Astoria Heat, Light and Power Company, opposite Hell Gate to the 132d street distributing station in the Bronx. It is run at a depth of 225 feet. The Astoria shaft is 34 feet 6 inches in diameter, 279 feet 9 inches deep, while the Bronx shaft has 26 feet diameter and is 233 feet deep. The total length of tunnel with shafts is 5,171.79 feet. It has a D-shaped cross section with bottom slightly

concaved; the excavated section was 19 feet 9 inches wide and 21 feet high. Shafts and tunneling are lined with concrete from 18 inches to 36 inches thick. The lining in the tunnel is reinforced with steel rods where bad ground is met. Inside cross section of completed tunnel is 16 feet 9 inches wide and 18 feet high. The stratification met with was Fordham gneiss at terminals and Inwood dolomite between. Ground was broken 12 Sept. 1910, and tunnel was finished in 1914. It carries two 72-inch gas mains and is provided for two more. In removing the remaining 122-foot bench to finish the excavating, in July 1913, a great rush of water was struck. The serious difficulty was overcome by covering the entire west side of the exposed bench by a series of concrete bulkheads and buttresses. But a rush of water near an emergency bulkhead that had been erected flooded the tunnel. Grouting till 8,850 bags of cement had been injected at a pressure of 400 per square inch sealed the leak, when the tunnel was pumped out after a delay of 102 days.

Detroit River Tunnel.— This tunnel was projected to carry the main line of the Michigan Central Railroad under the Detroit River across to Winsor, Can. Its sub-aqueous section is a twin tube 2,625 feet in length extending from a shaft back of the dock line on the Canadian side to one similarly situated on the Detroit shore. The Detroit side approach is a double track parallel to the main lines for 1,540 feet to the portal of a twin-arch approach tunnel 2,135 feet in length. This latter has a 2 per cent grade under yards and tracks. The Canadian approach contains 2,900 feet of open cut and 3,600 feet of twin-arch tunnel all on 1.5 per cent grade. The two sub-aqueous tubes are circular with a diameter of 20 feet. They have a continuous ⅜-inch steel plate shell 23 feet 4 inches in diameter enclosing a lining of 1:2:4 concrete, 20 inches thick. This concrete is reinforced by 1-inch longitudinal rods 18 inches apart on centres in a concentric circle. A concrete mass 1:3:6, 55 feet 8 inches wide at top and 30 feet 10 inches deep surrounds the tubes. This produces a continuous monolithic tunnel of two tubes having a diameter of 20 feet. The method of construction consisted of dredging a trench in the river's clay bed. The twin steel shells, which were constructed on the shore in 11 bulkheaded sections were floated to position and sunk separately, then connected by special joints. The concrete coating was deposited through tremies from a scow filling a form surrounding the shell sections. The water was next pumped out from each section and the 20-inch concrete lining was placed while other sections were being sunk. This process eliminated working in compressed air and has given much satisfaction. The sections of tubes are reinforced every 12 feet by vertical transverse diaphragms of ⅜-inch plates, stiffened at the diagonals and outer edges with 3½ by 3½-inch flange angles. Each section of the tubes received a 5-foot deep temporary bulkhead at each end before floating, affording a 10-foot space between the sunken sections and a manhole admitted a diver from the outside. The twin-tube sections were constructed on ways at the Great Lakes Engineering Company's shipyard 40 miles from their destination. They weighed about 550 tons and had a length of 262.5 feet. One section for closing was 64.5 feet long and weighed about 130 tons. The sections were towed by tugs from shipyard to tunnel site, requiring about 12 hours each. The trench in the river had a 48-foot bottom and a depth of from 22 to 40 feet. The first tube section was sunk 3 Oct. 1907, and the last during the fall of 1909.

Catskill Aqueduct.— This is a tunnel construction for supplying New York City with water conveyed from the Catskill Mountains. It is claimed by many experts as the most stupendous engineering project ever completed, even including the Panama Canal. It carries the water from the mountains to Staten Island a distance of 120 miles, and adds a capacity of 375,000,000 gallons per day to the New York City supply, and reserves a supply sufficient for a series of years of drought. The tunnel taps the great artificial Ashokan Lake which is fed by the Esopus Creek. It extends 92 miles from the reservoir to the northern boundary of New York City and continues 35 miles within the city limits, including the branch to the borough of Queens, Kensico storage reservoir, Staten Island, etc. The water supply is on a gravity system, free from pumping. The conduit of which the aqueduct consists is made up of several types, plain Portland cement concrete constructed in trenches then covered with earth; grade tunneling, pressure tunnels and steel-pipe syphons. Of the first is 55 miles construction having horseshoe section 17 feet high by 17 feet wide inside, composed of concrete without steel reinforcement and covered with earth embankment. Being the least expensive type this was used as much as the conditions permitted. Of grade tunnels there are 24 (14 miles in all) horseshoe shape, 17 feet high, 13 feet 4 inches wide. To cross broad, deep valleys circular tunnels were driven in the rock (where suitable) and lined with concrete. There are seven pressure tunnels of a total of 17 miles and a diameter of 14 feet. The connection of the pressure tunnels with the adjacent aqueduct portions is made (with one exception) by shafts. This exception is the Bryn Mawr steel-pipe siphon and Yonkers pressure tunnel. The tunnel through the city is also a pressure tunnel 18 miles long. For cleaning, repairs, etc., drainage shafts are furnished each pressure tunnel to unwater the same. The Hudson River is crossed in a tunnel excavated through granite 1,114 feet below sea-level connecting with a shaft at Storm King Mountain on the west bank and another shaft at Breakneck Mountain on the eastern bank of the river. Where the rock is insufficiently sound in valleys steel-pipe syphons were used instead of pressure tunnels. The pipes were constructed of 7 1-16-inch to ¾-inch steel plates rivetted together. The inside is lined with two inches of cement-mortar, and the tunnel is enveloped with concrete and covered with an earth embankment. There are 14 of the siphons with an aggregation of six miles. The cost of the Catskill water supply system, when completed, including surveys, real-estate, construction, engineering, general supervision and all items except interest on bonds will be $177,000,000, which will include the Schoharie addition.

New York Rapid Transit Tunnels.— The East River tunnels consist of four twin-tube tunnels, as follows:

1. *Old Slip Tunnel.*— From Manhattan to

Clark street, Brooklyn. This creates the Brooklyn connection for the "Seventh Avenue-Broadway" or west side line of the Interborough Rapid Transit Company's system. The bore between shafts is 3,799 feet long, with the land tunnel on the Manhattan side 355 feet long and that on the Brooklyn side 1,750 feet long. These tubes afford a single track totaling 11,800 linear feet. On the Manhattan side the tunnels passed through a section 975 feet long consisting of mica-schist in bottom and sand in the top of the tunnel. Under the centre of the river they passed through gneiss for a length of 470 feet. The rest of the tunneling was through soft material, mostly sand and fine gravel, with bowlders on the Brooklyn side. At the lowest point the tops of tubes are 71 feet below mean high water. But in places the natural cover over the tubes is *nil*. Here the former experiences with clay blanketing proved invaluable. Clay was dumped from the river surface to provide the necessary cover. Clay blanket process was used elsewhere to prevent "blow-outs." The lining consisted of standard bolted cast-iron rings 26 inches wide. Outside diameter of tunnel is 17 feet 6 inches. In rock inside diameter of iron is 16 feet 4 inches and a net clear diameter after concrete lining of 15 feet 4 inches. In soft ground heavier iron is used, giving 16 feet inside diameter of iron, and the net clear diameter of tunnel is 15 feet. In *rock*, the clear space outside the iron lining was packed with stone and grouted with Portland cement. In *soft ground*, fine gravel and grout were forced out by compressed air to fill the void left by the passage of the shield. The shield was worked in compressed air under a maximum pressure of 37½ pounds. Work commenced January 1915, and tunnels were opened to traffic April 1919. Cost was $6,300,000, including the station in Clark street, Brooklyn. The chief difficulty encountered was in tunneling almost directly under the foundations of buildings in Clark street, Brooklyn, in loose sand and gravel. This was successfully overcome by careful breasting of the face, and by blowing gravel and cement grout under high pressure to fill the voids behind the tail of the shield. This stopped all "settling," henceforth, of contiguous buildings.

2. *Whitehall Street, Manhattan, to Montague Street, Brooklyn.*—This tunnel will connect the Brooklyn Rapid Transit system on 4th avenue, Brooklyn, with the lower Broadway (Manhattan) line of the same company, now in operation. The length of this tunnel between shafts is 4,290 feet, the land tunnel, Brooklyn side, being 1,700 feet long. There are two "spurs" running into these tubes from the foot of Broad street, Manhattan (700 feet long), to provide for a future subway in that street. This tunnel affords a total single track of 13,735 linear feet. The tunneling was driven in mica-schist on the Manhattan side to a point 1,750 feet from the Manhattan shaft. The rest of the tunneling was in sand and gravel except for a reef of gneiss in the centre of the river, about 400 feet long. At the lowest point the tops of tubes are 75 feet below mean high water. Natural "cover" in the river in soft ground ran from 6 to 25 feet, but a clay blanket was used, when the tunnel was in soft ground, as a precautionary measure throughout. Standard bolted cast-iron, 26 inches wide, rings were used as lining. Outside diameter of iron was 17 feet 2 inches and 18 feet. The latter was always used when a shield was employed. Inside diameter of iron was 18 inches less in earth and 14 inches less in rock. Clear diameter after placing concrete lining is in all cases one foot less than inside diameter of iron lining. Outside the iron lining the same system of packing voids was used as in the Old Slip tunnel (see above). The excavation was carried forward by the medium of shield and compressed air; maximum pressure was 34½ pounds. Work commenced October 1914, and is nearly complete. Estimated cost is $5,750,000. In the course of the work the same difficulties were encountered as in the case of the Old Slip tunnel.

3. *Sixtieth Street, Manhattan, Tunnel to Borough of Queens.*—This tunnel will connect the Interborough Rapid Transit Company's elevated system in Queens, over which the Brooklyn Rapid Transit Company has operating rights, with the Brooklyn Rapid Transit subway under lower Broadway (Manhattan), now in operation. Length of tunnel from 2d avenue, Manhattan shaft is 1,364 feet. From Manhattan shaft to Blackwell's Island shaft is 1,610 feet, and from Blackwell's Island shaft to Long Island City portal is 1,740 feet. The Long Island City approach is in cut-and-cover and elevated construction and 2,607 feet in length. This twin tunnel affords 14,642 linear feet of single track. The tubes run through 1,800 feet of mica-schist from 2d avenue to the edge of the river on the Manhattan side, then through 700 feet of sand under the west channel of the East River, then through 1,200 feet of gneiss under Blackwell's Island, then through 600 feet of soft ground under the east channel of the East River, then through 400 feet of gneiss to the portal in Long Island City. At the lowest point (which occurs in the west channel) the tops of tubes are 98 feet below mean high water. At this point the tubes emerge from the natural river bottom, and tunneling had to be carried out through an artificial clay blanket 45 feet thick. Standard heavy. cast-iron lining was used only where shield was used, i.e., in soft ground or unsound rock. The iron rings are of the same type as in the above-described Whitehall street tunnel. In sound rock a circular concrete lining 13 inches thick was used, leaving a net maximum clear diameter of 15 feet. Where light iron lining was used (in unsound rock), the clear space outside was packed with stone and grouted with Portland cement (as in former cases). In soft ground only enough grout was used to fill the space left at the sides of the tunnel to prevent flattening; no structural weight being overhead in soft ground portions, filling or grouting was unnecessary. The maximum pressure used in shield work was 48 pounds. Work commenced August 1916 and was completed June 1919, but is not yet open to traffic; the cost was $4,230,000. The chief difficulty was the very high air pressure. This involved, at one time, 16 shifts daily. The men worked two 45-minute periods in the high pressure with a 5-hour interval.

4. *East Fourteenth Street, Manhattan, to North Seventh Street, Williamsburg.*—This tunnel connects the Brooklyn Rapid Transit Company's lines in Williamsburg (Brooklyn)

and East New York with a subway extending west under 14th street to 6th avenue, Manhattan, with provisions for transfer of passengers to the Brooklyn Rapid Transit subway on lower Broadway, now in operation. Its length between shafts is 3,437 feet. The Manhattan land tunnel is 1,627 feet, and that on the Brooklyn side is 2,025 feet. These twin tubes afford a single track 14,178 linear feet long. The land headings are entirely in soft ground, and the shield method with compressed air was used. The river tunnel proper (between shafts) will be in rock for about 2,300 feet and in sand and gravel for the rest of the distance —about 1,140 feet. At the lowest point the tops of the tubes are 97 feet below mean high water. The cover is ample except under the main ship channel near the Brooklyn side, where the tops of the tunnels emerge from the natural river bed, and there a clay blanket is used. The type of lining is same as described for Whitehall street tunnel (see above). About 1,100 feet of tube in sound rock will have no iron lining, but will be lined with a circular concrete lining 13 inches thick. Minimum clear inside diameter will be 15 feet. Filling of voids will be done on the same process as described in the case of Old Slip tunnel. Excavation is by shield in compressed air in soft ground; in rock without compressed air. Maximum pressure employed was 39 pounds. Work commenced August 1916 and is not completed. Land headings and soft ground shield excavation are complete from both shafts, and the headings in rock near the middle of the river were joined August 1919. Cost will be about $6,000,000. No unusual difficulties have been encountered.*

Harlem River Tunnels.— These connect the Lexington avenue subway with its extension northward into the Bronx. Its construction was carried out in substantially the same system as the Detroit River, Michigan Central tunnel described above. It consists of constructing steel tube sections; floating them to site; sinking into excavated river-bed trench; adding concrete outer covering through tremies. The metal sections are next unwatered and inner concrete lining added. This system eliminates working in compressed air, except in the few cases where divers' work is needed. This tunnel consists of four tubes rigidly fastened together by diaphragms. It was sunk in five sections, four of these sections being 220 feet long each and one 200 feet, or a total length of 1,080 feet. The diaphragms were spaced 15 feet and 7 inches apart and formed convenient pockets for placing the surrounding concrete. In the matter of joints a butt joint was used instead of the overlapping joints used in the Detroit work. Stiffening angles, which were used in the Detroit tunnels, were here placed outside. This saved much timber. This was a much easier engineering work than the Detroit tunnels, the distance being but 600 feet between the river bulkheads, and the top of the tunnel is only 7 feet lower than the original river bed. The Harlem River tunnels are 16 feet 6 inches in diameter inside the concrete lining, the interior walls having flat sides. The width of the finished structure is 76 feet and the height 24 feet 6 inches, including the surrounding concrete. The last section of tubing was sunk in September 1914.

The engineering of the New York subway tunnels was carried out under the direction of the Public Service Commission for the First District, State of New York. Mr. Alfred Craven was Chief Engineer during the inception of these projects and is still active as consulting engineer. Mr. D. L. Turner became Chief Engineer April 1917. Mr. Clifford M. Holland was in direct charge of the work as engineer of the tunnel division. For bibliography see under TUNNELS, GREAT MODERN.

TUNNELS AND TUNNELING. A tunnel may be considered an underground or sub-surface passage of any form of cross-section most suitable for the purpose of construction or for the purposes to be served after construction. It is ordinarily supposed to be constructed without disturbing the natural material over it or around it, although in some modern engineering works true tunnels are constructed by first removing the overlying material by open excavation if on land, or by dredging if under water, then constructing the tunnels by suitable means and refilling over the completed structure. Tunnels are of all sizes as well as shapes of cross-section and may be horizontal or inclined; indeed, a shaft may be considered a vertical tunnel. When tunnels are small and built ahead of the main structure or for subordinate purposes, as in mining, they are called headings or adits. Obviously, tunnels may be constructed for a great variety of purposes. They are commonly employed for railroad purposes, for the passage of foot and vehicular traffic under rivers as in the city of Chicago, for sub-surface transit purposes in large cities as in the city of London, to form aqueducts in great water supply systems, as for the city of New York with the 31-mile Croton aqueduct tunnel, for sewer purposes, and for serving other public conveniences in modern communities.

Ancient History.— The art of tunnel building is one of the oldest of engineering procedures. The ancient Egyptians built extensive tunnels for tombs and temples, and nearly or quite the same thing was done in ancient India. The ancient Assyrians constructed a tunnel under the Euphrates River, after having diverted its waters to another channel, the cross-section of which was 12 feet wide by 15 feet high. They also built other tunnels. The ancient tunnels were probably invariably built in rock or other hard material in which there was not sufficient water to give material trouble; there is no record of a true sub-aqueous tunnel being built in ancient times. Methods adapted to tunnel excavations through soft material saturated with water have been developed only in comparatively recent times. The old Romans were by far the greatest engineers of ancient times and they excelled all earlier peoples in their tunnel constructions as they did in all other constructions. The "fire-setting" method of tunneling was due to them as was also the method of sinking vertical shafts at different points on a tunnel line to afford a greater number of points of attack

* Above stated costs are for finished structure without track and equipment except ducts on either side, embedded in concrete benches both sides of tubes, to carry electric cables,

on the work. They built fires in their tunnels against the rock to be excavated, and, after heating it to the highest practicable temperature, suddenly chilled it by pouring water on it and taking advantage of the resulting softening, cracking and disintegration. They were also aware of the advantage of using vinegar instead of water in this method of tunneling through calcareous rocks, thus taking advantage of chemical action as well as disintegration by alternate heating and chilling. Probably the longest of the old Roman tunnels was that built to drain Lake Fucino; it was designed to have a section 6 feet by 10 feet. Forty shafts as well as inclined galleries were sunk for the construction of this tunnel 3½ miles long. The deepest shaft was about 400 feet. Most of the Roman tunnels were small, but they occasionally built large ones, like that for the highway in the Posilipo Hills between Naples and Pozzuoli, 3,000 feet long and 25 feet wide at the centre. The entrances are 75 feet wide and at the centre the height is 22 feet. Its general form, therefore, approximates the frustra of two cones with their small bases joined. This was for the purpose of concentrating the light in the central or less illumined portion.

In the Middle Ages.— Obviously the construction of ancient tunnels was excessively slow as well as laborious, although drills, chisels and even saws, fitted with hard cutting stones like corundum for teeth, were used even by the early Egyptians. Hammers and wedges were also employed. The first application of gunpowder of importance was probably at Malpas, France, in 1679–81, in the construction of the tunnel on the line of the Languedoc Canal, 510 feet long, 22 feet wide and 29 feet high. The first stimulating demand for modern tunnel construction of any great amount began with the construction of canals in France and England during the last half of the 17th century, and all of those tunnels were either in rock or dry hard ground. It was not until after 1800 that tunneling through sand and wet ground was undertaken in sufficient magnitude to be regarded as a branch of engineering construction. A tunnel for the Saint Quentin Canal in France was built through soft soil in 1803. The width of this tunnel was 24 feet, and timbering including struts and planking was used to support the walls and sides prior to constructing the masonry lining. From the earliest times the necessity of lining tunnels with masonry was recognized and it was done wherever the material was of such a weak and uncertain character as to make its self-sustaining qualities doubtful.

Modern Tunnels.— The greatest stimulus of all to the construction of tunnels was given when the construction of railroads began. From that time until the present, tunnel works of great magnitude, including those through sub-aqueous material, have been constantly constructed. Among the earliest of these were two tunnels built on the line of the Liverpool and Manchester Railway in England. The first tunnel of any kind built in the United States was that known as the Auburn Tunnel near Auburn, Pa., built in 1818–21 by the Schuylkill Navigation Company for the water transportation of coal. This tunnel was several hundred feet long and was about 22 feet high by about 15 feet wide. The first railroad tunnel in the United States was also in Pennsylvania on the Allegheny Portage Railroad and was built 1831–33. It was 901 feet long, 25 feet wide and 21 feet high. What may be properly termed epoch-making tunnel structures in the United States and in Europe are the Hoosac Tunnel in Massachusetts and the Mont Cenis Tunnel which pierces the Alps between Piedmont and Savoy. These are termed epoch-making structures because the exigencies of their construction first brought into use power-drills and high explosives, the two great modern agents in rapid and economical rock tunnel construction. The Hoosac Tunnel was built between 1854 and 1876, the progress of the work having been interrupted over long periods. Its total length is about 4¼ miles and it is a double-track tunnel. The Mont Cenis Tunnel was built between 1857 and 1872 and has a length of 7.6 miles. This is a single-track tunnel. The beginning of the work on the Hoosac Tunnel was quickly followed by the commencement of the double-track Erie Tunnel through Bergen Hill, near Hoboken, N. J. This tunnel was built 1855–61 and has a length of nearly 4,400 feet. Its greatest height is 21 feet and its width 28 feet. Among the more prominent tunnels of this country driven through rock, there may be mentioned the Croton Aqueduct Tunnel, 31 miles long with a horseshoe cross-section in general 13.53 feet high and 13.6 feet wide. The Niagara Falls Power Tunnel, 6,700 feet long, has a horseshoe section 19 feet by 21 feet. The single-track Cascade Tunnel on the Northern Pacific Railway, built in 1886–88, is 9,850 feet long. It is 16.5 feet wide and 22 feet high and is lined with masonry.

General Methods of Operation.—The more simple methods of excavating tunnels may evidently be employed for rock and firm earth or other materials relatively dry. In such cases it is customary to divide the cross-section of the tunnel into a number of parts and excavate them in such order as will be most conducive to economy and speed of completion. This division of the section into those parts successively excavated is illustrated by Figs. 1, 2 and 3. In each of those figures the numbers show the order of excavating the different portions, the part 1 being the first removed in each case. Fig. 1 shows the sequence of removal followed

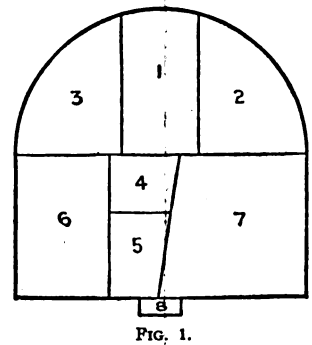


FIG. 1.

in the Saint Gotthard Tunnel, while Fig. 2 exhibits that followed in the Mont Cenis Tunnel; Fig. 3 illustrates the order of excavation in the "German method" of tunneling. If the first part, numbered 1 in the figures, is in the top

of the tunnel it is called a heading, but if it is at the bottom of the section it is called a drift. The heading or drift being first driven, the full tunnel section is reached by enlargement in the order or sequence shown. The usual width of heading is about 8 feet, although it may be but 6 feet. The height is about 7 feet. These dimensions give room for two men to work. Driving the heading is the most difficult and expensive operation of the tunnel excavation. These headings are sometimes driven 1,000 to 2,000 feet ahead of the full section, although that is not common. The alignment of the heading, which is also the alignment of the completed tunnel section, is transferred with great accuracy from the surface, either at the ends of the tunnel or down through shafts by various and well-known methods of engineering surveying. Shafts are the vertical passages sunk from the surface along the centre line of the tunnel or at a

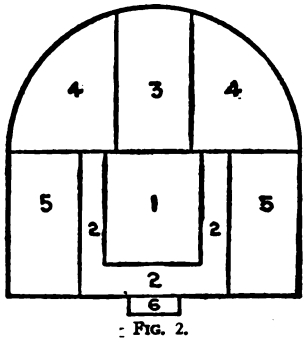


FIG. 2.

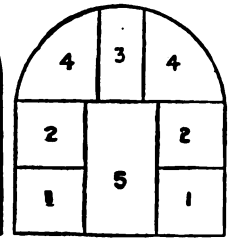
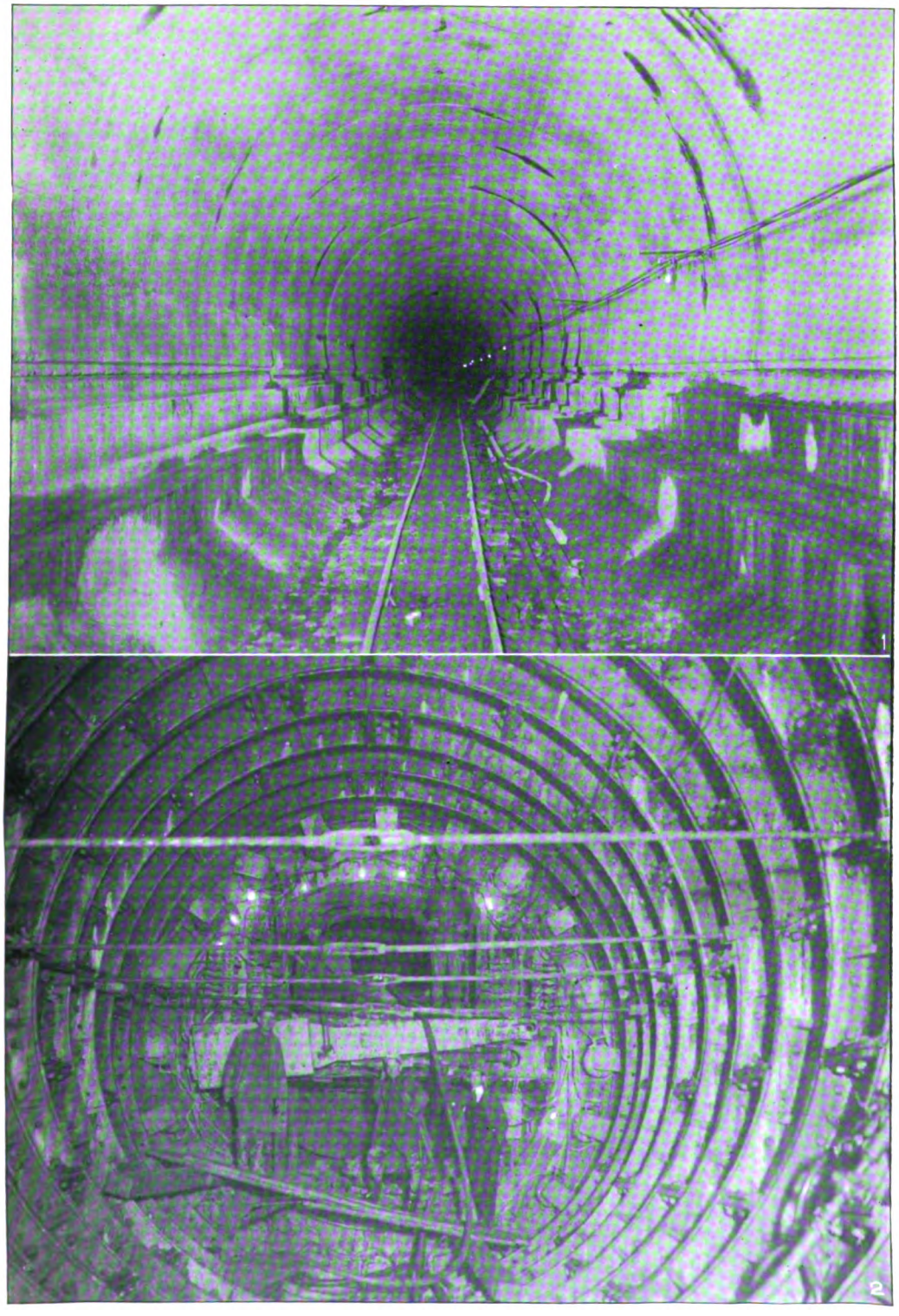


FIG. 3.

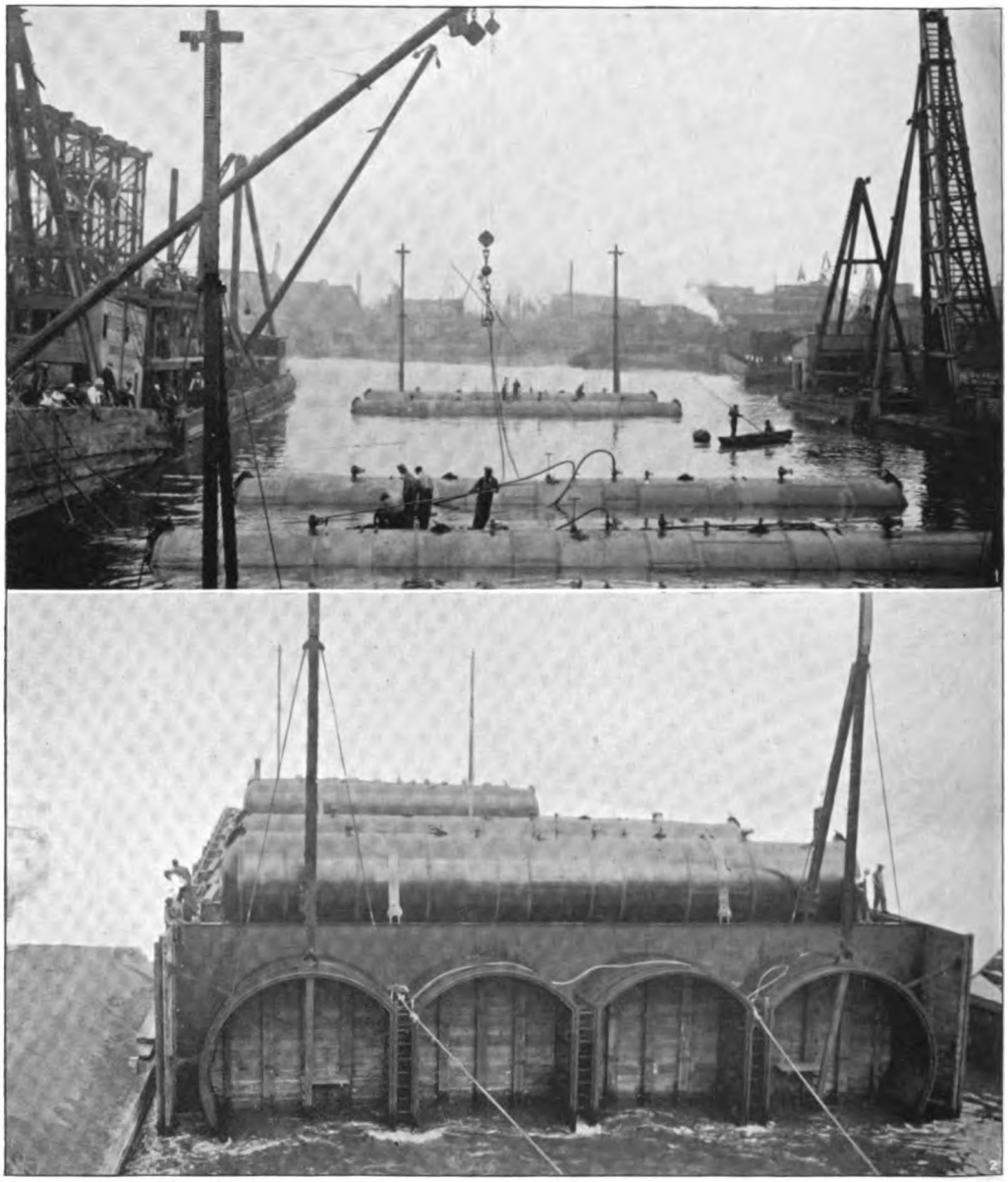
short distance on one side of that centre line for the purpose of attacking the excavation at as great a number of points as possible. They enable the work to be extended both ways from the point where the shaft is sunk and also form points at which the excavated materials are raised from the tunnel; they also permit material for lining or other purposes to be lowered into the excavation and put in place. Central shafts are usually employed, although French engineers frequently adopt side shafts having their axes 30 to 40 feet on one side of the centre line of the tunnel. At the present time power elevators are used in shafts for raising and lowering men and material. When the shafts are left open and lined where necessary, they become permanent features of the completed structures, affording ventilation. Where shafts are filled after the work is completed they are called temporary shafts, and they may be circular in section as is usually the case where they are lined, or they may be rectangular, their sides being braced with timber to prevent material falling in. Central shafts are more convenient than side shafts. If water flows into the tunnel excavation or is found in shaft sinking, it must usually be pumped to the surface. Tunnels are usually classified in relation to the material in which they are driven, such as tunnels in hard rock, in loose soil, in quicksand, cut-and-cover tunnels, sub-aqueous tunnels. On the whole, hard rock is probably the safest material in which to drive a tunnel and it gives the least difficulty. This is true chiefly in view of the effective explosives and covenient power-drills and other machinery now available for the purposes of excavation. Rock tunnels may be driven by using either a heading or a drift, depending upon the local circumstances in choosing the method. Tunnels in soil may involve serious difficulties if the soil is saturated with water. The excavation may be first made near the top, that is, near the soffit (the Belgian method); or along the perimeter (German method); or in two halves entirely independent of each other (the Italian method); or, finally, the whole section together (the English and Austrian methods). The Belgian method is more frequently employed in Europe. After excavating the material under the soffit the arched roof of the tunnel is constructed and supported on either side of the excavation until the lower part of the material is removed, when the necessary side and bottom lining is completed. In the German method two drifts are driven, one on either side of the lower portion of the section, as shown in Fig. 3, then others are

METHODS OF EXCAVATING TUNNELS

- In hard rock
  - By drifts.
  - By a heading.
- In loose soil
  - *By upper half;* The arch is built before the side walls. — Belgian method.
  - *By the perimeter;* Excavated and lined before the central nucleus is battered down. — German method.
  - *By whole section;* The lining begins after the whole section is excavated. — English method. Austrian method.
  - *By halves;* The lower half is excavated, lined and filled in again, followed by the work of the upper half. — Italian method.
- In quicksand
- Open-cut tunnels
  - In resistant soils.
    - By two lateral narrow trenches.
    - By one very large trench.
  - In loose soils.
    - By slices.
  - Built up.
- Sub-aqueous tunnels
  - At great depths under the river bed. — By any method.
  - At small depths under the river bed.
    - By shield.
    - By compressed air.
    - By shield and compressed air.
  - On the river bed.
    - By coffer dams.
    - By pneumatic caissons.



1 Concrete lining 60th Street Tunnel, Route No. 61
2 Details of iron lining and rear of shield, 60th Street Tunnel, Route No. 61



1 Harlem River Tunnel (Lexington Avenue Line). Sinking a section of tubes in final location
2 Harlem River Tunnel (Lexington Avenue Line). Section of tubes being towed into position for sinking — showing the four temporary buoyancy cylinders

opened above them until the completed perimeter except the lower central portion, which is then termed the "bench" (see Fig. 7), has been exposed. The masonry lining is then completed above the bottom. After removing the central portion of the material the invert or bottom of the masonry lining is put in place. The Italian method is more expensive than the others and is not often followed, but the English method is employed by excavating lengths from 10 to 25 feet, the masonry invert lining being completed first, then the side walls, and the top arch last. Tunnels in quicksand must be driven by methods applicable to soft soil saturated with water. Cut-and-cover tunnels have been more used for subways in cities than for other purposes. The most notable cases of these latter tunnels are the recently completed subways in the city of New York and the Boston subway, although a considerable portion of the latter was built without removing the material over the top of the finished arch. Sub-aqueous tunnels are the most difficult of all to build and require the employment of special methods and appliances which will be described later on.

Excavation.— The statement on the preceding page shows the general character of excavation for thetion for the different kinds of tunnels to which allusion has been made. It is taken from 'Tunneling' by Charles Prelini, C. E.

The Timbering of Tunnels.— As excavations are made for tunnels not only in rock, but also frequently in soft material, it is necessary to support the sides and top of the excavation to prevent material falling in, and this support is usually given by timber struts and planking, called either lagging or poling boards, suitably disposed concurrently with the excavation. As round sticks are more economical than sawed timber they are usually employed for this purpose. Methods of putting this timber in place vary largely with the methods of excavation employed and the sequence in which various portions of the tunnel are excavated. If the material is reasonably self-sustaining, as clay and much firm earth as well as most rock, the entire excavation may be completed closely in front of the timbering already in place if it is not desired to follow the excavation immediately with the masonry lining. In rock tunneling the masonry lining may usually be completed, where needed, immediately following the excavation without much or any timbering. In soft material, however, it is usually necessary to use timber supports, even for the first excavation, in the heading or drift. In fact, it is commonly necessary to insert poling boards, as they are called, ahead of the actual excavation, as shown in Figs. 4 and 5. The poling boards are inserted over the crown bar or top horizontal round stick of the bracing and under the block on which one end of the previous poling board rests, thus enabling the soft material to be excavated at the front part of the heading without the newly exposed material falling down. After the heading or drift is thus excavated and timbered. other portions of the cross-section are excavated concurrently with placing the supporting timbers, so that when the entire section is excavated there will be a complete system of supporting struts and cross timbers with the poling boards or lagging resting directly against the soft material of the sides and roof. These supporting timbers are so placed as to permit small dump or tram cars to be used for carrying out the excavated material. Obviously, the precise method of using poling boards will depend upon the manner or sequence in which the different portions of the excavation are completed and the kind of material found. It is equally evident that the poling boards and lagging may be used lengthwise of the tunnel or transversely, as shown in Figs. 4 and 5, the former necessitating the excavation of the least amount of material and being preferable in most cases. After thus completing the excavation and timbering, the masonry lining may be put in place, the timbering being removed as fast as the masonry progresses. The lagging and poling boards usually remain undisturbed back of the masonry lining. The timber which has been removed when the masonry is laid may be repeatedly used, not more than about 20 per cent of it usually being destroyed in any one use.

The Lining of Tunnels.— Reference has already been made to the masonry lining of tunnels. This lining may be constituted of almost any grade of suitable masonry, in accordance with its durability, strength and facility of being put in place. The kind of lining masonry is determined largely by the convenience and economy of the local supply. If the tunnel is in saturated water-bearing material the static head or pressure on the lining may be very great, and the thickness of masonry must be sufficient to carry that water pressure. Occasionally also there may be some little motion of the rock through which the tunnel is driven. In such cases the masonry lining must be of sufficient thickness to resist that movement. While no general rule can be given, the thickness of masonry lining may be from 1 to 4 or 5 feet, the least thickness being suitable for rock not very liable to fall and the greater thickness for such soft material as wet clay and sand and in cases where the static pressure of the saturating water may be very great. In some special locations for temporary purposes timber lining has been used, but it is not ordinarily employed for permanent work. Iron lining has also been employed under certain special conditions, but it is not often used for other than those methods of driving tunnels through soft material with the aid of the pneumatic process and the shield, the circular cast-iron lining being put in place immediately behind the shield. This cast-iron lining is made in sections with flanges for joints and for stiffening purposes which when put in place form a complete circle. These sections are sometimes not more than 2 feet by 4 feet, while in other cases they may be as much as 5 feet or 6 feet square. In all cases they are cast so as to form complete circular cylinders when put in place and bolted together.

The Pilot Method of Tunneling.— This method has not been extensively employed. It was introduced in 1880 by Anderson of Anderson and Barr, who used the method in the construction of the main relief sewer tunnel in Brooklyn, N. Y., in 1891. About 700 linear feet of this sewer has a diameter of 15 feet, 4,700 linear feet has a diameter of 14 feet, and 3,940 linear feet has a diameter of 12 feet, making

9,340 linear feet in all. The material penetrated was mostly sand and gravel, some of it being wet. The principal feature of the method is a wrought-iron cylinder of one-fourth inch plate and 6 feet in diameter, the axis of which corresponds with the axis of the tunnel. This

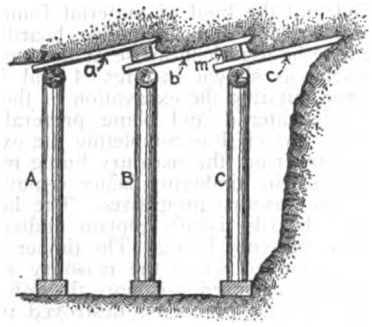


FIG. 4.

small 6-foot heading or pilot is the first portion of the tunnel excavated. The front end of the pilot was carried about 30 feet ahead of the completed tunnel section, allowing a 10-foot length of four-ring brick masonry lining to be put in place, while 15 to 20 feet of the pilot rested in unexcavated material. As fast as excavation was made at the front end of the pilot, plates were taken off the rear end which projected into the finished work and put in place at the front end. In this manner the pilot was carried ahead as fast as excavation could be made. In this case the pilot was built of one-fourth inch iron plates carrying 3-inch by 3-inch angles on their edges. The excavation then made around the outside of the pilot was closely followed by radial struts with one end supported against the pilot and the other end carrying iron plates and lagging to protect the exposed face of the excavation. Iron plates were used over the crown of the finished excavation, but were not carried down on the sides, although they could be so extended if desired. In this manner the complete tunnel was successfully excavated and the material held back until the brick lining used in this case was in place. All work was done at ordinary atmospheric pressure. No other large work has been completed by this method, although it possesses advantages for many localities.

Baltimore Belt Line Tunnel.—This double-track tunnel is a part of the double-track line of railway in the city of Baltimore, Md., built for the Baltimore and Ohio and Western Maryland railroads. It was driven through a great variety of materials, some of which were soft and saturated with water and gave much trouble. Rock was penetrated in some places and in others clay so hard and tough as to require blasting for its removal. For the greater part of its length, however, this tunnel was driven through soft material, some of which carried so much water that it was with difficulty that the work could be prosecuted without danger of serious settlements at the surface above it. In one case the settlement caused the destruction of a large building. The general plan of operations was that of the German method. Drifts along the sides of the tunnel were first driven, thus providing for the drainage of the upper part of the material to be removed. Portions of the side walls were built in these drifts and subsequently extended upward to the elevation of the springing line of the arch. The top heading was then driven and the adjacent side portions were immediately thereafter removed, thus completing the excavation to the full width of the upper half of the section. All these drifts and other excavated portions were heavily timbered and strutted so as to protect the exposed surface to the greatest possible extent. The illustrations show the method of strutting or bracing and the use of the poling boards employed. (Figs. 6 and 7). In laying up the arch of the tunnel both iron and timber centres were employed. As is shown in the illustrations the masonry of the arch and side walls was laid up inside of the exterior line of round struts and the poling boards outside of them. The voids outside of the tunnel masonry were filled with rubble masonry so that no vacant spaces were left unfilled. The lining of the arch in general consisted of five rings of brick work, but where the soil was unusually soft eight rings were employed. The large amount of water in the material under the tunnel caused considerable difficulty in building the invert. Enclosures, however, of short sheet piling transversely across the tunnel were formed, within which the material was excavated and the foundation course of concrete 8 inches thick was laid. On this concrete foundation the brick invert was placed. One of the unique features of this work was the 6-inch perforated pipes which were inserted radially about 10 feet into the soft wet material surrounding the upper part of the tunnel where it was deemed feasible to resort to this procedure. Through these perforated pipes thin Portland cement, mortar or grout was forced into the surrounding soft material, so that when the Portland cement set a solid stiff mass of material was produced instead of the saturated and easily flowing natural material. The bottom side drifts and the masonry walls built in them were ordinarily carried about 20 feet ahead of the arch, although at times this work was as much as 90 feet in advance. The arch was usually built in complete transverse sections about 18 feet in length.

General Features of Method Used in Quicksand.—The construction of the Baltimore Belt Line Tunnel illustrates some of the general features of method suitable for use in quicksands and other soft materials. Quicksands are simply fine sand mixed to some extent with fine clayey matter and saturated usually with running water. All wet material is soft, and in tunneling through such material the first effort is to drain that part of the excavation as effectively as possible. This is accomplished by driving either a centre bottom drift or, as in the Baltimore Belt Line Tunnel, two bottom side drifts, all of which are well calculated to drain the material above them. If the water does not flow away from these drifts by gravity it may be led into sumps and removed from them by pumping. After this draining is accomplished the remaining material is taken out by some method such as those already described, timber bracing or

strutting being introduced concurrently with the excavation. Poling boards are constantly used to keep the material from falling into the excavation and the joints between them are frequently packed with hay or material of similar character so as to permit water to enter without bringing with it the soft material. The masonry lining is then put in place as already described in connection with the Baltimore Belt Line Tunnel, frequently leaving the exterior line of strutting and the poling boards in place. The hardening of soft material may also be produced in other ways than by injecting Portland cement grout, as by freezing or by stock ramming.

Sub-aqueous Tunnels.— All the preceding methods of tunneling described pertain to tunnels not driven below open water, although the material which they penetrate may be fully saturated with water. The most difficult tunneling is that which must be carried on at considerable depths below the surface of free water above the work. In such cases the water finds its way through either porous material or through crevices or fissures in the overlying rock so that both the completed tunnel and the work in progress are subjected to a water pressure represented by the static head of the water above them. Occasionally in rock tunneling under such conditions or in stiff clay, water may flow in upon the work in quantities not too great to make its removal by pumping feasible. Whenever, however, water enters too freely for such procedures, compressed air must be used to keep the water out, the pressure of air being determined by the depth of the work below the water surface. When tunneling is prosecuted under these conditions a «shield» is ordinarily used, as will be described further on. An instance illustrating the method to be followed in sub-aqueous rock tunneling will first be given.

The Severn Tunnel.—This tunnel, a double-track tunnel, a little less than 4½ miles long, was built under the river Severn in the southwestern portion of England between 1873 and

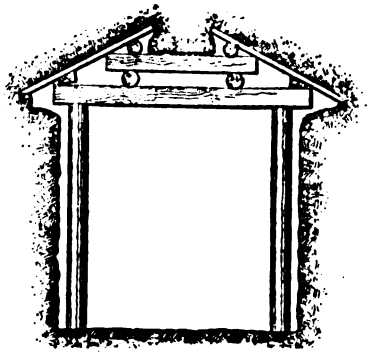


FIG. 5.

1886. Although this tunnel was built largely through rock, for a short distance the material penetrated was gravel. The bed of the river at the tunnel site is composed of strata of conglomerate limestone, carboniferous beds, marl, gravel and sand. The least thickness of the natural cover over the tunnel is 30 feet of marl on the English side of the river. At the deepest part of the river channel the thickness of the sandstone over the tunnel is about 45 feet. The entire tunnel is lined with vitrified brick work 2¼ to 3 feet thick, laid in Portland cement, the invert having a thickness of 1½ to 3 feet. Much water was encountered in the prosecution of this work which produced grave difficulties. Indeed, at one time the entire work was flooded for a period of 13 months. The water gave much trouble at other times, breaking through in large volumes, but in no other instance was the work suspended on account of the water for a period of more than a few weeks. Pumps were employed to raise the water through a side heading connecting with a shaft 29 feet in diameter. The greatest amount of water raised concurrently by all the pumping stations was about 27,000,000 gallons in 24 hours, although the total pumping capacity provided was equivalent to about 66,000,000 gallons in 24 hours. The ventilation of this tunnel, which is a matter of great importance on account of its length, is accomplished by a fan 40 feet in diameter in one of the shafts, making 43 revolutions per minute and drawing out 447,000 cubic feet of air per minute to an 18-foot shaft near to the work.

Tunneling by the Use of a Shield.— The method which has been employed more than any other for sub-aqueous tunneling in soft

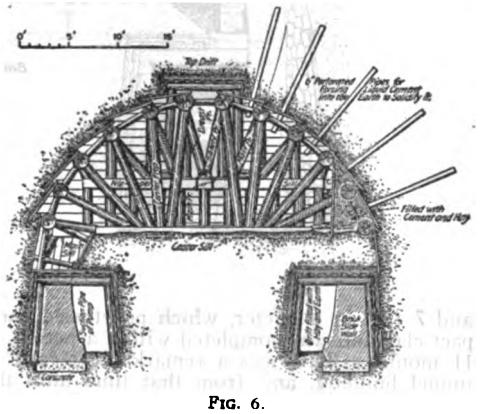


FIG. 6.

materials is that which it is believed was first devised and applied by the great French-English engineer, Sir M. I. Brunel. Brunel was born in France in 1769, spent six years in the United States, then went to England and became one of the greatest civil engineers of Great Britain, where he died in 1849. He secured his first patent covering the use of a shield for sub-aqueous tunneling in 1818. He first employed a shield in the effort to build a tunnel under the Thames River at London in 1823. His first shield was found to be too weak in actual service and had to be replaced by another and somewhat larger one designed by and built under the direction of Brunel himself. This shield was rectangular in transverse section, 37 feet 6 inches wide by 22 feet 3 inches high, and by the use of it two parallel tunnels of horseshoe shape were built, each being 13 feet 9 inches wide and 16 feet 4 inches high, the two being separated from each other by a wall 4 feet thick. This dividing wall was not continuous, but was pierced by arch openings, each about 4-feet span about every 20 feet. The total structure built of brick work was 38 feet wide over all and 22 feet high. The tunnel

was finished in 1843, making the total time of construction, including all stoppages and delays, 20 years. Another English engineer, Peter W. Barlow, patented in England in 1865 a method of sub-aqueous tunneling by the use of a circular shield with a cylinder cast-iron lining for the completed tunnel. After 1869 he was associated with the English engineer, James Henry Greathead (1844–96), in the construction of the tunnel under the Tower of London, 1,350 feet long and 7 feet in diameter, which penetrated compact clay and was completed within a period of 11 months. This was a remarkable record in tunnel building, and from that time until the present numbers of tunnels in soft material under water have been constructed on what is commonly known as the Greathead system, which simply means the use of a cylindrical or circular shield, developed from Brunel's original plan and subsequently perfected by Greathead. The use of the shield has made it possible to construct tunnels under rivers at depths below the surface of the water as great as the effect of compressed air on laborers will permit, it being a matter of comparative indifference how soft the material may be, except that the softer or more easily flowing the material the more carefully must the work be executed. The shield is composed of a cylindrical shell usually constructed at the present time of steel plates and angles or other shapes with a heavy braced diaphragm placed at right angles to the axis of the shell. This diaphragm is of heavy steel plate and shape construction. It may have a number of openings in it closed by doors or other suitable devices. These openings in the diaphragm permit laborers to excavate the material immediately in front of the shield. If the tunnel is a large one the openings may have platforms in front of them, on which laborers stand in order to make the desired excavation through the openings themselves. If the material being penetrated is very soft and porous an inrush of water may take place even when compressed air is used, and the diaphragm must be strong enough to resist the resulting pressure. It may be, and usually is, heavily braced with plates and angles, both vertical and horizontal. The illustrations show how complicated its construction may be. The cylindrical shell in which the diaphragm is located may extend from one to 10 or 12 feet in front of the diaphragm and from 6 or 8 to 26 or 27 feet behind it. The tunnel lining, usually of cast iron from one inch to two inches in thickness and possibly lined with masonry, is constructed within the rear or tail of the cylindrical shell, so that the latter always overlaps by two or three to four or five feet the finished lining of the tunnel, thus preventing any material or water falling into the completed work. Obviously as the workmen excavate the material in front of the shield, pass it through the diaphragm and take it out in the rear, the shield must be moved forward so as to bring its front end again up to the face of the excavation. As these shields are very heavy masses of steel, weighing sometimes 40 to 80 tons or more, and as the friction of the surrounding material on the sides of the shell must be overcome, a heavy force is needed to make the movement. This force is usually supplied by hydraulic jacks so devised and placed around the circumference of the diaphragm as to push against the completed iron lining of the tunnel. These jacks have cylinders six inches or more in diameter and are actuated with water or other liquid at a pressure of 1,000 to 3,000 or 4,000 pounds per square inch. A shield about 21.5 feet in diame-

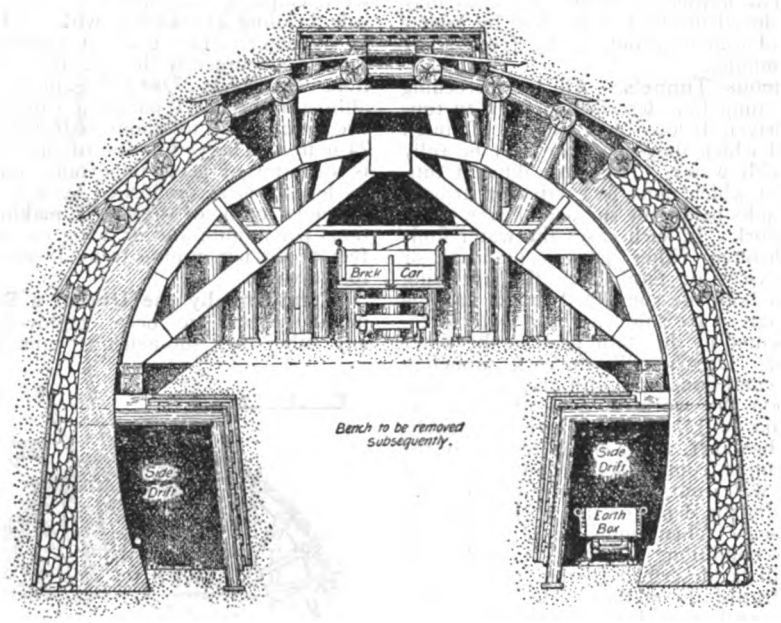
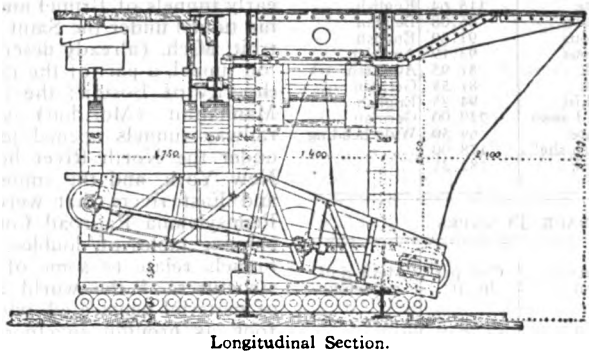


FIG. 7.

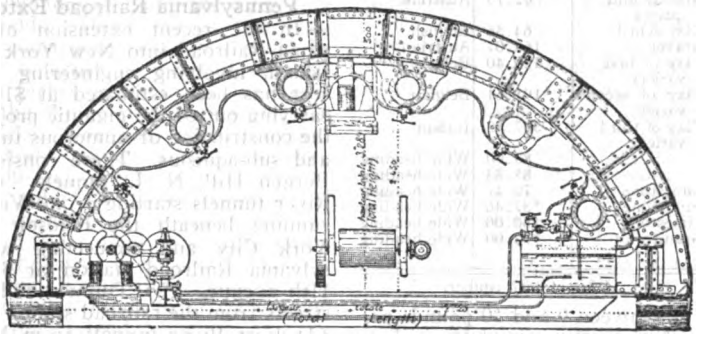
ter was used in the construction of the Sarnia tunnel under the Saint Clair River above Detroit, Mich. This shield was moved by 24 hydraulic jacks, as shown in the illustration, each having a capacity of 125 tons and so placed as to press directly upon the cast-iron tunnel lining behind it. By such means the shield may be pushed ahead as fast as the excavation is made and the tunnel lining completed behind it.

The Saint Clair River tunnel is a single-track railroad tunnel built in 1890–91 by the Grand Trunk Railroad. The total length of the tunnel is 6,000 feet, made up of 1,162 feet on the United States side of the river, 844 feet on the Canada side of the river, and 2,310 feet under the Saint Clair River. It is built through the clay underlying the river and has a clear inside diameter of 19 feet 10 inches, the cast-iron shell being two inches thick and having an outside diameter of 21 feet. The cast-iron shell is lined with six inches of brick and cement. The shield was 15 feet 3 inches long and required from 450 to 2,000 tons to move it during construction. The maximum daily progress through the clay was 15.3 feet. The average monthly progress was 230.4 feet from the American side and 219 feet from the Canadian side.

The transverse section of a shield may be circular, elliptical, or any other shape; it may even be rectangular, as in the case of Brunel's Thames tunnel. The shield for the Clichy sewer tunnel in Paris was elliptical in outline. Again, if the material is not too soft, the shield may be segmental only, that is, comprising but a part of the outline of the full shield, usually the upper part. The shield for the use of the East Boston tunnel recently constructed was segmental and was used for the roof of the tunnel only, as is also shown in the illustrations. The front portion of the cylindrical shell, consisting of the front portion of the shield as a whole, may be vizor-shaped if material is not too soft. In such a case the upper part of the fresh excavation is protected by the vizor extension of the shield. Where the material is stiff enough to hold itself up for a short time the front extension of the shell is not needed.



Longitudinal Section.



Cross Section.

FIG. 8.

It is thus seen that the purpose of the shield is to prevent the inrush of water and soft material while excavation is being made, the diaphragm of the shield acting as a bulkhead and the openings in it being so devised as to be quickly closed if necessary. The extension of the shield in front of the diaphragm is designed to prevent the falling or flowing in of the exposed face of the new excavation. The extension of the shell back from the diaphragm is designed to afford opportunity for putting in place the finished tunnel lining, whether of cast iron or of steel plates lined with masonry. Where the material is saturated with water it is usually necessary to use compressed air in connection with the shield. The intensity of this air pressure is determined by the depth of the tunnel below the surface of the water above it. A greater intensity of pressure is needed for the material at the bottom of the tunnel than at the top, but as the pressure required for the

bottom must in general be used, there will be danger of "blow-outs" at the top, requiring great caution in soft material. With a diameter of shield of 22 feet the pressure at the bottom of the excavation may exceed the water pressure at the top by between 9 and 10 pounds per square inch. Such inequalities tend to produce either a "blow-out" at the top of the heading or an inrush of water and soft material at the bottom. The following table was compiled by Mons. R. Le Gouez and shows the dimensions of the cylindrical shells of some of the principal shields used in tunneling through soft material up to the present time.

The friction on the outside of the shell of the shield against the surrounding material may be over 1,000 pounds per square foot or much less than that. The amount of nominal hydraulic jack power required may be roughly taken at 4,000 to 6,000 pounds to every square foot of frictional surface on the outside of the shell of the shield.

Some of the principal later tunnels constructed by the aid of shields, in addition to the early tunnels of Brunel and others, are the Sarnia tunnel under the Saint Clair River, near Detroit, Mich. (already described); the East Boston tunnel, a part of the rapid transit system of the city of Boston; the two parallel Hudson-Manhattan (McAdoo) single track electric railway tunnels opened to the public in 1908, under the North River between Hoboken and New York, and the tunnels under the North and East rivers that were constructed by the Pennsylvania Railroad Company. The accompanying tables of double-track and single-track tunnels relate to some of the principal tunnel structures of the world and give the quality of material penetrated, with the cost per linear foot, as brought together by Charles Prelini, C.E., in his 'Tunneling.'

Pennsylvania Railroad Extension Tunnels. —In the recent extension of the Pennsylvania Railroad into New York City and Long Island, involving engineering enterprises, the cost has been estimated at $100,000,000. The carrying out of the gigantic project necessitated the construction of numerous tunnels, both land and sub-aqueous. These consist of: (1) The Bergen Hill, N. J., tunnels. (2) The North River tunnels starting from Weehawken, N. J., running beneath the Hudson River to New York City and connecting with the Pennsylvania Railroad station at 33d street, near 11th avenue. (3) Tunnels under 33d and 32d streets from the railroad station to First avenue. (4) East River tunnels from Manhattan shaft of New York City side of the river, running under East River to Long Island shaft and Long Island City.

DOUBLE-TRACK TUNNELS.

NAME OF TUNNEL	Quality of soil	Cost per lin. ft.	Method of tunneling
Mont Cenis	Granitic	$273.73	Drift
Saint Gothard	.....	193.63	Heading
Stammerich	Granitic	157.90	English
Stalle	Broken schist	290.58	Austrian
Rothenfels	Dolomite	115.64	English
Dorremberg	Calcareous	86.08	Belgian
Stafflach	Calcareous	91.69	English
Open	Calcareous	93.19	Austrian
Wartha	Grewack	87.95	Austrian
Mertin	Grewack	87.55	German
Schloss Matrei	Clay schist	94.25	English
Trietbitte	Clay and sand	229.00	German
Canaan	Clay-slate	69.50	Wide heading
Church-Hill	Clay with shells	178.00	.....
Bergen No. 1	Trap rock	182.31	.....

SINGLE-TRACK TUNNELS.

NAME OF TUNNEL	Quality of soil	Cost per lin. ft.	Method of tunneling
Mont Cenis	Gneiss	$82.27	Heading
Stalletti	Granite and quartz	62.75	Austrian
Marein	Clay schist	64.36	English
Welsberg	Gravel	165.07	Austrian
Sancina	Clay of first variety	129.40	Belgian
Starre	Clay of second variety	191.61	Belgian
Cristina	Clay of third variety	307.42	Italian
Burk	.....	83.90	Wide heading
Brafford Ridge	.....	85.33	Wide heading
Dunbeithe	Limestone	70.47	Wide heading
Fergusson	Sandstone	*37.46	Wide heading
Port Henry	Limestone	†80.00	Wide heading
Points	Granite	*72.00	Wide heading

* Are unlined. † Lined with timber.

NAME OF SHIELD	Length in feet				
	Diameter	Tail	Body	Front	Total
Concorde Siphon	6.75	2.51	2.55	1.16	6.67
Clichy Siphon	8.39	2.51	2.55	1.16	6.16
Mersey	9.97	5.61	2.98	2.98	11.58
East River	10.99	3.51	0.32	3.67	7.51
City and South London	10.99	2.65	2.82	1.01	6.49
Glasgow District	12.07	2.65	2.82	1.01	6.49
Waterloo and City	12.99	2.75	2.98	1.24	6.98
Glasgow Harbor	17.25	2.75	2.98	1.08	8.49
Hudson River	19.91	4.82	2.98	5.67	10.49
Saint Clair River	21.52	4.00	2.98	11.25	15.25
Clichy Tunnel	23.7–19.8	4.00	2.98	6.88	17.22
Clichy Tunnel	23.8–19.4	7.44	11.90	4.46	23.65
Blackwall	27.00	6.98	5.90	6.59	19.48
Waterloo Station	24.86	3.34	5.51	1.14	10.00

Bergen Hill Tunnels.— These consist of two parallel single-track, concrete-lined tunnels 5,920 feet long between portals. The boring through Bergen Hill was largely in trap rock (diabase), partly in sandstone. Some of the former was so extraordinarily hard as to require 10 hours to drill a 10-foot hole in the heading with a number 34 slugger drill at 90 pounds air pressure. Work started May 1905 and completed May 1908. Height of the tunnel inside is 16 feet 2 inches from the top of track rail to crown. The tunnel is lined with concrete variably, according to the soils to be supported. The water proofing is of six-ply felt and seven layers of pitch. Bench walls at either side of tunnel carry conduits for telephone, telegraph, etc.

North River Tunnels.— These extend from 10th avenue, New York City, to the large shaft at Weehawken, N. J., crossing under the Hudson River. They consist of two single-track tubes lined with cast-iron rings, and have an outside diameter of 23 feet, and 21 feet 2 inches inside diameter. The subaqueous portion is 6,128 feet long. Work was started April 1904 and completed 1910. The Weehawken shaft was a large piece of work being over the tunnels and including both. Difficulties occurred from the treacherous nature of the rock, which hindered work till it was lined its entire length with concrete. The tunnels under the river were driven with shields. The floors of two platforms were so constructed that they could be extended 2 feet 9 inches in front of the cutting edge or 8 inches in front of the hood. The motion to the sliding platforms was given by hydraulic jacks. The land tunnels consist of 977 feet of double tunnel on the New York City side and 230 feet on the New Jersey side. The Manhattan end (from 11th avenue to 32d street) is very complicated, having in its 977 feet nine different styles of cross section caused by a curve; for the curve is effected *in straight lengths* not curves. Parts of the land tunnels were shield driven but other parts were open-cut work and ordinary land tunneling, as great variation was found in the nature of the material met with; some soft ground caused some cut-and-cover work. The cast-iron rings of the tube are bolted together through holes in flanges. After lining with concrete the inside diameter of the tube is 19 feet, but after laying the flat bed there is left 16 feet 7 inches from top of rails to soffit of arch. The concrete lining is reinforced with steel rods. Excavating was done under an average air pressure of 25 pounds when air pressure was needed.

Cross Town Tunnels.— These extend easterly from the Terminal Station to permanent shafts east of First avenue under 32d and 33d streets. For an average of 350 feet west from the First avenue shafts there are four tunnels in sound, fairly dry rock which was drilled and blasted, but this Hudson schist varied considerably physically and an ancient water-course was struck causing difficulties. Sand also caused much trouble in spots. Some open-cut work on 32d and 33d streets caused much underpinning of houses. On Sixth avenue the Elevated Railroad was underpinned to rock. Concrete lining is used on these twin tunnels. These two-track tunnels have their crown about 60 feet below street surface. In the three-track tunnel heavy brick arching was used for tunnel lining and concrete for roof of open-cut work. These tunnels were completed March 1909, but roadway restoration required further time.

East River Tunnels.— These connect the cross-town tunnels, by tunnels beneath the East River, with Long Island City. They consist of four single-track, cast-iron and concrete lined tubes with an outside diameter of 23 feet, starting from two permanent shafts on the east side of the river. Each tunnel is about 6,000 feet long, 3,900 feet of which is between the shafts each side of the river and 2,000 feet in Long Island City. The work was finished in exactly five years. The East avenue heading needed at start 15 pounds air pressure for soft ground and considerable water; then rock permitted discontinuance. A shield was soon brought into use but found impracticable except for a short distance under the Long Island passenger station. Solid rock excavating was done with bottom-heading-and break-up or with top-heading-and-bench methods; soft ground in top of rock tunnel was excavated in normal air by mining-and-timbering method. In some parts of this work water was struck and tunneling was done in compressed air *without a shield* by building the iron lining up to face of the full-sized excavation, then top-heading a hole for about 10 feet in advance about 3 feet wide by 4 or 5 feet high, then timbering. A permanent shaft was constructed on the Manhattan side over each pair of tunnels. The four river tunnels between the Manhattan-Long Island City shafts were constructed with shields working both ends at once. One difficulty overcome was that caused by the small depth of roof at the deepest part of the river (at the Manhattan pier-head line) and consisting of fine sand. Safer cover to protect against blow-outs was given by adding blankets of clay on the river bed seven to ten feet thick. Air pressure carried in soft ground work were from 30 to 34 pounds ranging up to 37 pounds in tunnels B and D at Manhattan and up to 42 pounds for short periods to remove broken plates. The chief difficulty was in soft sand allowing the shield to settle, thereby breaking plates in the bottom of the rings. Blow-outs of such severity occurred as to stir up the bed of the river sufficiently to necessitate shutting down work for three weeks to allow the river bed to consolidate and permit further work. Standard cast-iron tunnel lining was used, giving 23 feet outside diameter with rings 30 inches wide, 11 segments and a key to each ring. Inside diameter of tubes is 21 feet 2 inches. There are 1½-inch thick webs in the central portion; flanges are 11 inches deep. In passing from rock to soft ground cast-steel rings were added as reinforcement for a short stretch. The iron tube is line with concrete. For Bibliography see under TUNNELS, GREAT MODERN.

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TUNNY, or **HORSE MACKEREL**, a large, brilliant and valuable fish of the mackerel family (*Thunnus thynnus*), which occurs in shoals in almost all the seas of the warmer and temperate parts of Europe, Asia, Africa and

America, but is not equally common in every season or in all parts of the seas which it frequents. Immense numbers enter the Mediterranean by the Straits of Gibraltar in May and June and immediately divide, one part following the shores of Europe and the other those of Africa, in search of a place to deposit their spawn. The fishery is one of the most important in the Mediterranean, especially about Sardinia. At the approach of winter the fish retires to deep water. It often, besides, wanders widely and has acquired many local names, as albacore, horse-mackerel, etc. It is not uncommon in the Pacific off Santa Catalina, where it is known as the tuna, and is angled for from small launches that run out to sea. Large examples, and they sometimes attain a weight of 1,500 pounds, fight so determinedly for freedom that many hours are often consumed in mastering them. Tuna are caught off the Atlantic Coast, especially about Block Island during the months of August and September. At times they readily take artificial bait, being fished for by trawling. The large Wilson spoon or squids are used; the larger fish are harpooned. Although readily sold when captured and much relished there is no regular fishery for the tunny in the United States. See MACKEREL.

TUPAC AMARU II, the name assumed by a Spanish-Peruvian adventurer: b. Tinta, 1740; d. 10 Sept. 1780. His name was José Gabriel Condorcanqui and his mother was the daughter of the last of the Incas. He was killed on the failure of an uprising which he had planned.

TUPAIA, or BANXRING. See TREE-SHREW.

TUPELO, Miss., town, county-seat of Lee County, on the Old Town Creek and on the Mobile and Ohio and the Kansas City, Memphis and Birmingham railroads, 100 miles southeast of Memphis, Tenn. It is in an agricultural and stock-raising region. The water supply is obtained from about 40 artesian wells. The chief industrial establishments are cotton presses, cotton-gins, flour mills, spoke factories, furniture factories, brickyards and machine shops. The two banks have a combined capital of $100,000. It has a high school and graded schools. Pop. about 3,881.

TUPELO, one of the several American trees of the genus *Nyssa,* family *Cornaceæ. Nyssa* is found also in Eastern Asia. There are swamp-loving trees, with alternate, entire, or nearly entire leaves, and regular, small, greenish flowers in capitate clusters, the fertile blossoms sometimes solitary, on slender axillary stalks, and appearing with the foliage. The drupe is more or less oval, with a compressed stone. *Nyssa sylvatica* is the sour gum, or pepperidge, growing farther north than the other species, and more apt to be found away from water, and made conspicuous in autumn by the scarlet of its foliage and by the dark-blue fruits, which are a valuable food for migrating robins. When leafless it is still noticeable, for the picturesque growth of its limbs, sometimes in round heads, often horizontal, as if the many knotty branches lay in strata. The bark is rough and gray. The wood is of a light color, but with a twisted grain, which makes it difficult to work. This unwillingness to split, however, makes it desirable for beetle-heads, ox-yokes, hubs of wheels, bowls, etc. Tupelo is durable when completely immersed in water, especially if salt, and is, therefore, of value for ships' keels; but it will not stand alternation of moisture and dryness. The southern mountaineers value it for "chaw-sticks,"—small pieces of the stem, chewed into brushes with which they may dip up snuff. In consequence of its erratic growth and fibre, sour-gum trees were debarred as evidence in boundary disputes, in cases where some time had elapsed after blazing trees, as shown by the condition of the scar. *Nyssa ogeche,* called the Ogeechee lime, from the stream of that name, which is said to be about its northern limit, is an inhabitant of southern river-swamps liable to inundations. Its young branches have a silvery gray back, and the short petioled oval leaves are whitish pubescent beneath, when young, and are about six inches long. It becomes a large tree of handsome but somewhat peculiar habit. The fruit is of the size and shape of an olive (which caused the French in Mississippi to call this tupelo "the olive"), but is scarlet, and of an agreeable acid flavor. It is preserved in sugar. The wood is of little account, being soft, and the roots of one variety are so light that buoys for fishermen's nets were made out of them. *Nyssa aquatica* is the large tupelo, or "cotton" gum, so called because tomentose in all its more youthful parts.

TUPELO, Battle of. In March 1864, Gen. N. B. Forrest, at the head of a large force of Confederate mounted infantry, advanced from Mississippi and made a raid through West Tennessee to Paducah, Ky. Upon his return he assaulted and captured Fort Pillow (q.v.) on 12 April. General Sturgis set out from Memphis to pursue him, and was badly defeated by Forrest, at Guntown (q.v.), 10 June, and pursued back to Memphis. On 5 July Gen. A. J. Smith, with Colonel Grierson's cavalry division, two infantry divisions of Gen. J. A. Mower and Col. D. Moore, of the 16th corps, and a brigade of colored troops, under Col. E. Bouton, in all about 14,000 men—11,000 infantry and 3,000 cavalry—and 24 guns, left La Grange, Tenn., to march southward against Forrest, then reported in the vicinity of Tupelo, Miss. On the evening of the 7th one of Grierson's cavalry brigades, when near Ripley, attacked a Confederate cavalry force of 500 men, under Lieutenant-Colonel Hyams, driving it back and inflicting a loss of 35 killed and wounded, with a loss to itself of four wounded. Smith moved on through Ripley, crossed the Tallahatchie River at New Albany on the 9th and on the 10th encamped about five miles north of Pontotoc. Next morning the march was resumed and Pontotoc was found occupied by McCulloch's cavalry brigade, supported by a brigade on a hill immediately south. The Seventh Kansas cavalry were deployed as skirmishers and, supported by a brigade of infantry, advanced and drove in the Confederate skirmishers and at the same time Grierson's cavalry, gaining the east side of the town, attacked the Confederates in flank and drove them from the place and the hill beyond, leaving several dead and wounded. Gen. S. D. Lee joined Forrest and assumed command of all the Confederate forces. Smith remained at Pontotoc on the 12th and a reconnoissance developed the fact that the main

Confederate force was about nine miles south on the Okolona road, on the opposite side of a low, swampy bottom, through which ran two creeks, a position which he did not deem prudent to attack, and upon which he demonstrated only. Early in the morning of the 13th he marched out of the town eastward for Tupelo, 18 miles distant, on the Mobile and Ohio Railroad. General Lee, informed of Smith's movement, ordered it checked before the railroad was reached. Forrest, with a brigade and a regiment, made successive attacks upon the rear, which was covered by Bouton's colored brigade and the Seventh Kansas cavalry, but was repulsed and kept back, and Buford's and Chalmers' divisions attacked the train in flank, causing the destruction of a few wagons, but were driven back by Mower's division, which captured some prisoners and a battle-flag. At dark Smith camped at Harrisburg, a mile from Tupelo, in good position on a knoll almost clear of trees, beyond which was a growth of timber. Mower's division was drawn up on the right of the Pontotoc road, on which the army had marched, and Moore's division on the left of the road, with Bouton's colored brigade on the extreme left. Meanwhile Grierson's cavalry division had occupied Tupelo, proceeded to destroy the railroad and was then disposed on both flanks of the infantry. Early in the morning of the 14th Lee ordered Forrest to attack Smith's left, and at 7.30 A.M. Forrest, having dismounted his entire command, made an impetuous charge, with four brigades in line, supported by Chalmers' division and Lyons' brigade. The assault fell upon Moore's division and the left of Mower's, but failed to shake either, although four successive attempts were made. Between the assaults Forrest's artillery was very active, but was effectively replied to by two Union batteries, whose fire was so annoying that a brigade charged them but was repulsed. After a hard struggle of one and one-half hours Forrest withdrew from Moore's front, leaving many dead and wounded. He now marched to the left, crossed the Pontotoc road and advanced in three lines against Mower, whose men reserved their fire, until the charging lines, closed in mass, were quite near; then they opened upon them with musketry and canister, driving them back in disorder; but they rallied and renewed the attack. For over two hours the battle raged on Mower's front; then he ordered his division to advance, which it did, capturing many prisoners and driving Forrest from the field about noon. The afternoon was spent caring for the wounded of both armies and burying the dead. About 9 o'clock in the evening Forrest made an attack upon the extreme left of the Union line, including Bouton's colored brigade. The attack was easily repulsed. At an early hour of the 15th Forrest's men advanced from the cover of the woods in front of Mower's division; Mower charged them and they fled to their horses and rode away. Meanwhile another advance was made on the extreme left, held by Bouton's brigade. For two hours there was sharp artillery firing, when Forrest, under cover of his guns, came forward, but was met by a counter-charge, led by Smith, which broke Forrest's line and sent it in retreat. It was now past noon. Smith's ammunition had run low and he had a scant supply of rations. Grierson had destroyed some miles of railroad and after the last repulse of Forrest Smith moved slowly northward about five miles and went into camp for the night at Old Town Creek. The men were settling themselves for a rest when shells from the rear fell and burst among them. Bell's brigade, with a battery, had closely followed the column and attacked; Mower turned upon them; Crossland's brigade came up and joined Bell; but both were repulsed by Mower with severe loss and fell back upon McCulloch's brigade, which held ground. McCulloch was desperately wounded, Forrest was wounded and some prominent officers were killed. Smith resumed his march next morning, followed for two days by two brigades of Forrest's cavalry and reached Memphis on the 23d. Smith had about 14,000 men engaged and his losses, from the 11th to the 15th, were 77 killed, 559 wounded and 38 missing. The Confederate troops engaged numbered about 6,600; their losses, as reported by Forrest, were 210 killed and 1,116 wounded. Consult 'Official Records' (Vol. XXXIX); Wyeth, 'Life of Gen. N. B. Forrest'; The Century Company's 'Battles and Leaders of the Civil War' (Vol. IV).

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TUPÍAN STOCK. The chief linguistic stock of South America and in its corrupted form the trade medium throughout the Amazon region. The Tupian tribes held the greater portion of the territory when the Portuguese took possession of Brazil and as a rule were superior to the other aborigines. They practised agriculture and were experts in many arts. Their houses were for the most part communal. The Tupían languages have been extensively cultivated. Consult Adam, Lucien, 'Matériaux pour servir à l'etablissement d'une grammaire comparée des dialectes de la famille Tupí' (Paris 1896).

TUPPER, tŭp'ẽr, SIR **Charles,** Canadian statesman: b. Amherst, Nova Scotia, 2 July 1821; d. in England, 1915. He was graduated from Edinburgh University in 1843 with the degree of M.D.; began the practice of medicine in his native town and in 1867–70 was president of the Canadian Medical Association. He entered political life in 1855 when elected as a Conservative to the Nova Scotia assembly and there became a leader of his party in the adoption of a more progressive policy, became provincial secretary in 1857 and in 1864 Premier of Nova Scotia. He took a leading part in bringing about the union of the Canadian provinces and in the organization of the Dominion government, attending the Charlottetown and Quebec conferences and the final conference at London. In 1867 he was elected to the Canadian House of Commons, representing his constituency there from 1867 to 1884, from 1887 to 1888 and from 1896 to 1900. He was president of the Privy Council in 1870–72, Minister of Inland Revenue in 1872 and Minister of Customs in 1873. The Conservative government being defeated in the last-named year, he became one of the principal organizers and leaders of the opposition and brought before Parliament the plan of moderate protection for home industries, subsequently adopted by a Conservative administration. On the return of his party to power in 1878 he entered the government as Minister of Public Works

and in 1879 organized and became first Minister of the Department of Railways and Canals; in this office he greatly assisted the construction of the Canadian Pacific Railway. In 1884 he went to London as High Commissioner of Canada, returning for a time in 1887–88 to become Minister of Finance, but resigned that office in 1888 and resumed his position in London. In 1896 he again returned to Canada to enter the ministry and was Secretary of State until April, when he became Premier; but his party was defeated in June of that year and he was chosen leader of the opposition in the House. He lost his seat at the election of 1900 and retired from public life. In 1887 he was one of the plenipotentiaries to the fisheries conference at Washington, which resulted in the treaty settling the fisheries dispute. In 1879 he was knighted and in 1888 made a baronet. Consult his 'Recollections of Sixty Years' (Toronto 1914); Sanders, E. M., 'The Life and Letters of the Right Honorable Sir Charles Tupper' (1916).

TUPPER, Sir Charles Hibbert, Canadian statesman, son of Sir Charles Tupper (q.v.): b. Amherst, Nova Scotia, 3 Aug. 1855. He was educated at McGill and Harvard universities, taking the degree of LL.B. at the latter in 1876. In 1878 he was admitted to the bar and began the practice of law at Halifax, later practising in British Columbia. He was elected to the Canadian House in 1882 and re-elected in 1883, 1887, 1891 and 1896. He entered the Conservative government as Minister of Marine and Finance in 1888, holding that office till 1894. In 1895 he was Minister of Justice and Attorney-General and for a short time in 1896 solicitor-general. As Minister of Marine, he obtained the passage of several acts providing for the safety of ships and seamen; as Minister of Justice he dealt ably with the Manitoba school question. In 1893 he represented Great Britain in the Bering Sea arbitration tribunal at Paris; in the same year he was knighted. He retired in 1904.

TUPPER, Martin Farquhar, English poet: b. London, 17 July 1810; d. Albury, 29 Nov. 1889. He was graduated at Christ Church, Oxford, in 1832; studied at Lincoln's Inn; was called to the bar in 1835, but never practised, and in 1838 published the original edition of his 'Proverbial Philosophy.' This he expanded into four series (1839–76). The earlier of these went through about 60 editions. By 1881 the work had reached the sale of 1,000,000 copies in America. The readers of it were either those whose ridicule made Tupper synonymous with the egregiously commonplace or those who calmly absorbed the strange effusion with convictions that the author "had eclipsed Solomon." It was summarily treated by reviewers, parodied widely and cleverly and for the years of its popular success remained a favorite butt of the critics. Remarks regarding him may be found in 'Passages from the English Note-Books' of Hawthorne (1870). His other writings, such as 'War Ballads' (1854) and 'Rides and Reveries of Mr. Æsop Smith' (1857), were less conspicuous. In 1851 and 1876 he visited the United States. Consult the autobiographical 'My Life as an Author' (1886).

TUPPER LAKE, N. Y., an Adirondack village in Franklin County, on the northern branch of the New York Central Railroad, about 108 miles northeast of Utica. Its chief industry is lumbering. Pop. about 3,200.

TURA, too'rä, or **TOORA,** Siberia, a tributary of the Tobol, 78 miles west of Tobolsk. Its length is 300 miles.

TURANDOT, an oriental fantasy in verse by the Venetian dramatist, Carlo Gozzi (q.v.), was th fourth of his *Fiabe* (those odd nursery-tale plays) and was produced in Venice, 22 Jan. 1762. To confute the criticisms of his adversaries, that the *Fiabe* owed their success to utilization of magic metamorphoses and scenic mechanism, Gozzi replied with a work from which the supernatural element and complicated stage devices were eliminated. The theme is the familiar Persian tale of the cruel princess averse to matrimony who compels her royal suitors to solve three riddles or to suffer death. This bald subject, already known to European literature from the 'Gesta Romanorum,' becomes amplified in Gozzi's hands into a five act tragi-comedy by the addition of a secondary plot, the love of the enslaved Princess Adelma for the princely hero, Calaf. Gozzi, with his customary anachronisms, places the scene in Pekin and transfers there under the guise of court officials the stock Italian masks, Pantalone, Brighella, Truffaldino and Tartaglia, whose Venetian humor gives the comic contrast to the serious plot. Turandot, the daughter of the gentle Emperor Altoum, has successfully eluded all suitors till Calaf solves the three enigmas. Excepting the third and fourth acts which are cluttered with seraglio bickerings and the insertion of the secondary action, beautiful in the handling of the confession of Adelma's love, the drama maintains its interest remarkably well. Calaf is strikingly poetic in his unswervable love and his detached romantic intensity. His faithful follower, Barach, is a well-drawn type of loyal devotion and self-sacrifice.

Lacking the essentially local appeal of the other *Fiabe,* 'Turandot' was frequently translated into other languages, notably German, and obtained a success far beyond its repute in Italy. Schiller's version for the Weimar stage (1802) surpasses the original in poetic form and pathetic sentiment. The beautiful incidental music of Ferruccio Busoni (1906), the recent translation of Karl Vollmœller (1911), attest to its vitality in Germany. In January 1913 a three-act adaptation from Vollmœller's rendering was played at the Saint James' Theatre, London. This singular favor among foreign nations serves to contrast with the almost complete extinction of the work in Italy. It is true that 'Turandot,' like the other *Fiabe,* was written for a transitory purpose in the conflict between the older dramatic forms and the newer art of Goldoni. The defects of the *fiabesque* drama are less apparent in 'Turandot'; the style, so wretchedly slipshod and full of Venetian colloquialisms elsewhere, rises here to higher flights. Nevertheless, Gozzi in his own country has received scant credit for the merits of this quaint work. Consult Magrini, G. B., 'I tempi; la vita e gli scritti di Carlo Gozzi' (Benevento 1883); Masi, Ernesto, 'Le Fiabe di Carlo Gozzi' (Bologna 1884); Symonds, J. A., 'The Memoirs of Carlo Gozzi' (London 1890); Bithell, Jethro, 'Turan-

dot, Princess of China' (an adaptation in three acts from the German, London 1913).

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TURANIAN, a designation applied to the so-called agglutinative family of languages — that is, languages in which no proper inflection exists, but in which pronouns are made to adhere to the root of the verb to form the conjugation and prepositions to substantives to form the declension. There must be no proper incorporation between the root and the adhering word; the two must simply lie side by side, agglutinated or "glued" together, but one must not modify the form of the other. The Turanian languages are agglutinative, while the Aryan and Semitic languages are inflectional, and the term Turanian is made to include every language of America, Asia and Europe that is not Aryan or Semitic, with the exception of Chinese and its related dialects. (See CHINESE LANGUAGE AND LITERATURE). Max Müller divides the Turanian languages into two great divisions, the Northern and the Southern. In the Northern he includes five classes, the Tungusic, Mongolic, Turkic, Finnic and Samoyedic. He divides the Southern into four, the Tamulic or Dravidian languages of the Dekkan, the dialects of Bhotan and Tibet, the Taic of Siam and the Malayic of the Malay and Polynesian islands. He groups under these nine classes 116 dialects, to which others add Acadian, the Basque and North American tongues. There is serious doubt among philologists as to whether the agglutinative languages should be classed as a group, under a family designation and Peile, in his work on 'Philology,' published in 1877, expresses the view that "these languages are much too different to give any ground at all for believing that they all belong to the same family." See ETYMOLOGY; LANGUAGE; PHILOLOGY; SCIENCE OF LANGUAGE; SPEECH.

TURATI, Filippo, Italian Socialist: b. at Como, 1857. On graduating in the law at Bologna in 1877 he was appointed counsellor from the province of Milan and later was elected a member of the Chamber of Deputies. He served as editor of *La critica sociale* (1891–1903), the Socialist organ, and became leader of the Italian Socialists until temporarily deposed in 1904 by Enrico Ferri. He was, however, returned to power in 1910 on his reformist policy by the Milan congress.

TURBAN, a distinctive covering for the head, consisting of a long cloth wound around, sometimes enclosing a cap or tarboosh worn by most nations in the Orient and of very various forms in different nations and different classes in the same nation. In Moslem countries the style of the turban frequently indicates the position or rank of the wearer. The Turkish sultan's turban contains three heron's feathers, with many diamonds and other precious stones. The grand vizier has two heron's feathers; other officers but one.

TURBAN-SHELL, a top-shell (q.v.), of the genus *Turbo,* so-called from its fancied resemblance to a Moorish turban; it is one of the commonest shells in the stock of every dealer in trinkets, polished to show its nacreous underlayers or fashioned into some ornament.

TURBELLARIA, the whirl-worms; a class of free-swimming platyhelminthes, characterized by the ciliated epidermis containing rhabdites, a delicate body and usually also a muscular protrusible pharynx. They were named by Ehrenberg in 1831 on account of the microscopic whirlpools produced in the surrounding water by the constant vibration of their epidermal cilia. Some of these forms are minute and resemble infusoria; such are the *Rhabdocœlida* (q.v.). With the exception of certain rare parasitic forms all *Turbellaria* are carnivorous; they overpower the prey, perhaps by the peculiar cutaneous structures (rhabdites) already noted and then suck out the substance of the victim by means of the pharynx. The *Turbellaria* include three orders, based primarily upon the character of the alimentary canal, namely, (1) *Polycladida,* in which the intestinal branches are numerous, radiating from a common cavity above the pharynx; all are marine. (2) *Tricladida,* in which the intestine has three main branches, extending one anteriad and two posteriad from the pharynx. (3) *Rhabdocœlida,* in which the alimentary canal is straight and simple or at most slightly lobed. Almost all species are hermaphroditic, although in many male and female organs are in activity at successive periods rather than synchronously. The reproductive system is always complex. In many instances sperm masses are introduced into the body of a second individual by subcutaneous injection, being implanted in the skin at any point and compelled thus to make their way through the tissues to the proper location.

TURBERVILLE, or **TUBERVILLE, George,** British poet: b. Dorsetshire, about 1530; d. about 1610. He was educated at New College, Oxford, and became a Fellow in 1561 but left without a degree and studied law in London. He went to Russia in 1568 with Thomas Randolph, English Ambassador, and of his latter days nothing is known. He wrote pleasing verses and translated from the Latin and the Italian. Selections from his poems may be found in 'Early English Poetry' (edited by Fitzgibbon, London 1887).

TURBINE, literally that which spins or whirls around; *in mechanics,* a wheel which rotates by the aid of flowing water, air or steam and thus furnishes motive power for machinery. Although the steam-turbine is as old as the Christian civilization it is only within the last half century that it has been fully developed. The ordinary turbine with which we are most familiar is the horizontal water wheel made to rotate by the escape of water through orifices, under the influence of pressure derived from a fall.

Water-Turbine.— There are three recognized types of the water-turbine, (1) the radial; (2) axial; (3) combined or mixed-flow. Turbine wheels are made in various sizes from five to seven feet in diameter, with still larger sizes for extraordinary purposes. Perhaps the most powerful water-turbines in the world are those installed in 1894–95 for utilizing the power of Niagara Falls (q.v.). The supply of water to the turbine is regulated by a gate or gates, which can partially or entirely close the orifice where the water enters or leaves. The speed of a turbine is regulated by opening and closing the gate which admits the water. Where the

power used fluctuates, the speed will fluctuate unless some method is adopted to adapt the power developed to the power utilized. This is usually done by means of a governor, which is so devised that when little power is being used the resulting increase in speed will actuate it to close partly the gate, and when much power is being used, the decrease in speed will actuate it to open the gate wider.

High and Low Pressure.— Turbines are divided into high and low pressure, the former being relatively small, revolving at a high speed, driven by elevated heads of water. The low-pressure turbines are relatively larger, contain a larger volume and run at a lower rate. In the Black Forest, Germany, turbines are running with heads of 72 and 354 feet, and having diameters of 20 and 13 inches, respectively. Low-pressure turbines perform excellent duty with large volumes of water having only nine inches head.

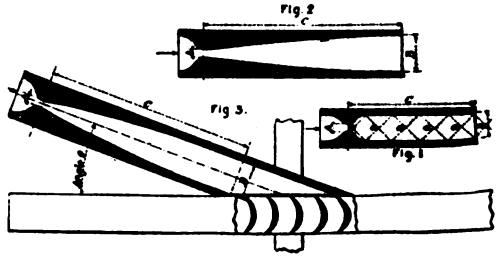
The Radial Turbine.— In radial turbines the water in passing through the wheel flows in a direction at right angles to the axis of rotation or approximately radially. The water may flow inward from the circumference to the centre or outward from the centre toward the circumference. The best-known type of the inward flow is the Francis turbine, and of the outward flow the Fourneyron turbine.

The Axial Turbine, or parallel flow as it is sometimes called, is one in which the water flows through in a direction generally parallel with the axis of rotation. The water may flow from the top downward or from the bottom upward. The best known type of the downward flow is the Jonval turbine.

The Combined Turbine, or mixed flow, is any combination of the radial or axial; that is, the water may flow inward and up or down or outward and up or down. Still another classification is made to distinguish reaction turbines from impulse turbines. In the reaction turbine all parts are filled with moving water, while in the impulse turbine the buckets or other parts are only partly occupied by the water passing over them, the atmosphere having access to the remaining space. A reaction turbine is driven by the dynamic pressure of the water, which may be under a certain static pressure, due to the fact that the inflow takes place under pressure, since the wheel is always filled with water. In the impulse turbine the inflow takes place freely against air pressure only. Most turbines are built on the reaction principle. For a more detailed description of water turbine see HYDRAULICS; WATER-WHEEL.

The Steam-Turbine.— The earliest known steam-turbine was that invented by Hero which is described in an Alexandrian manuscript of about 120 B.C. This was not a practical invention, however, being merely a toy. Little progress was made in the turbine up to the 17th century. Branca made an impulse steam-turbine in 1624, and Edward Somerset followed with a device in 1650. The French engineer Tournaire is entitled to particular mention as having in 1853 indicated the capabilities of the steam-turbine. But the general introduction of the steam-turbine since 1890 is due to the Swedish engineer De Laval and to C. A. Parsons. Thus it is acknowledged that the progress of the steam-turbine is wholly modern and mainly recent. Only after evolution of the modern mathematical sciences could its action be understood and the machine be properly designed; only after modern tools and methods of mechanical construction had become refined could it be built in safe and economical forms. The influence of the Héro toy or Alexandrian invention upon modern engineering is shown to have been of great value. The Hero idea lay dormant during nearly 2,000 years which elapsed between the days of Greek philosophy and modern, practically applied, science.

Modern Development.— Steam-turbines are heat engines, converting the calorific energy of the steam into directly-available mechanical energy. From another point of view they are

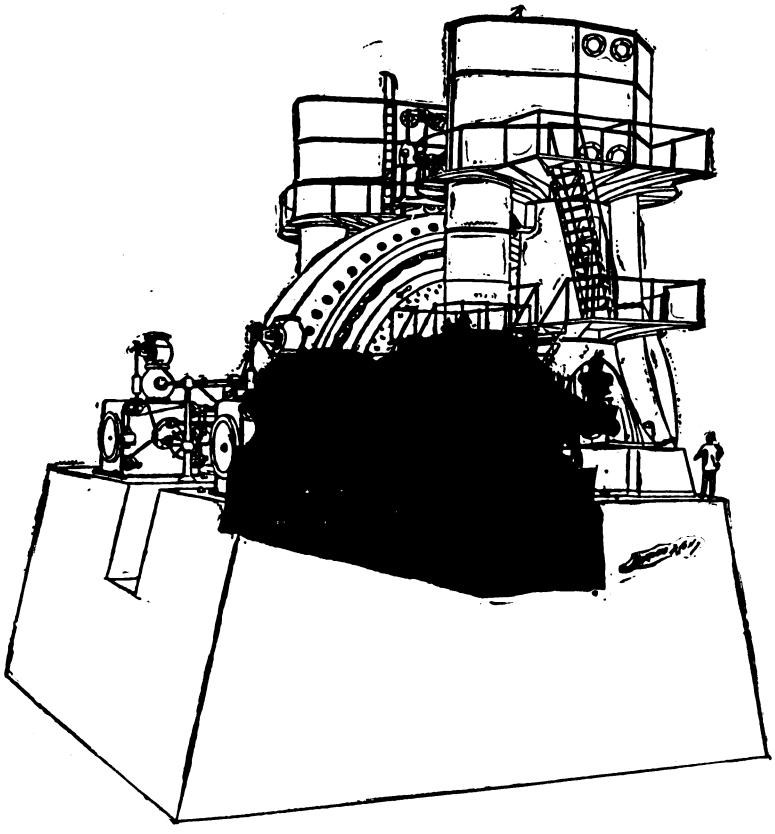


Turbine Jets.

analogous to hydraulic turbines, and in design, construction and operation are controlled by the same ultimate principles. To-day the turbine is more nearly a "perfect steam-engine" than any other known type, so far as its design and construction are concerned. As in the case of hydraulic turbines the steam-turbine is divided into classes; the two principal ones being action and reaction turbines; and each of these classes is subdivided accordingly as the turbine is composed of a single wheel or of several wheels, traversed successively by the steam in course of expansion. Among reaction turbines (compared in hydraulics to the Jonval turbine) of which, as multiple machines, the prototype is the Parsons turbine, the steam is only partially expanded in the distribution and acquires its full expansion in the movable wheel. The steam, therefore, acts on the blades at once by its pressure and its velocity. In the action turbine, the steam only acts on the movable wheels by its velocity. Each wheel revolves in a casing in which the pressure is uniform. Action turbines revolve at a less velocity than reaction turbines. There are now recognized three ways of utilizing steam for the transformation of heat into useful work: (1) By directing a jet of steam on all movable objects, such as the blades of fans, or, in reaction wheels, by allowing the steam passage itself to revolve; (2) by condensing steam in a cylinder and allowing the external atmospheric pressure to force a piston inward; (3) by cutting off slices of high-pressure steam and expanding in the cylinders of the modern reciprocating engine. The present-day steam-turbine designer, however, is merely concerned with the first and oldest method.

The Impulse Steam-Turbine.— The simplest possible steam impulse turbine must consist essentially of a fixed nozzle guiding a jet of steam upon vanes arranged at a periphery of a rotating wheel in a very similar way to the buckets of the water-wheel; but to turn this

wheel efficiently it is necessary not only to make the nozzle of suitable dimensions and shape for the work to be done, but to form the vanes or buckets of the wheel so that they make the best possible use of the steam as delivered from the nozzle. The function of the nozzle is to convert the whole available energy of the steam into mass velocity in the required direction. It should, therefore, be designed so as to expand the steam to the same pressure as that of the wheel chamber before the delivery on the vanes. If the nozzle is improperly formed, either the expansion will not be complete and the jet will burst into a cloud at the orifice, or eddy currents will be set up within the nozzle itself and retardation of flow will be the result. To arrive at the best shape of steam nozzle, the ratio of expansion required should be first decided and the area of entrance — A in Fig. 1 — should bear a relation to the orifice, B, in direct proportion to the increased volume of steam when expanded. The curve of nozzle walls is calculated to allow gradual expansion, until maximum velocity, due to initial pressure energy, is attained. Fig. 1 shows an example of what is found to take place in an incorrectly shaped nozzle. The steam particles rebound from the walls as shown by the dotted lines, and meeting at *a a a a* form points of greatest pressure. Turning again to Fig. 2, if the length, C, is too great, there will be retardation of flow due to the skin friction, and if C is too short the steam will not have time to expand completely. The area at A, then, depends on the quantity of steam to be passed; the area, B, on final pressure required, and the length, C, on the velocity of flow due to the difference between initial and final pressures. The best shape for wheel vane faces is undoubtedly as nearly a semi-circle as is permitted by the angle of the nozzle in Fig. 3. This angle is usually about 20 degrees, which is nearly the maximum possible. While being of sufficient area to reverse the direction of current without shock or eddy, these vanes should be short, so as to minimize skin friction, and the edges should be sharp to avoid blanketing the nozzle. The most efficient mean speed of vanes is just under half the velocity of the steam current, thus leaving the exhausted molecules relatively motionless. For this reason single disc turbines must revolve at enormous speed and be geared down for driving ordinary machinery. For example, a 10-inch De Laval turbine working at 70 pounds' pressure revolves 14,000 times per minute.

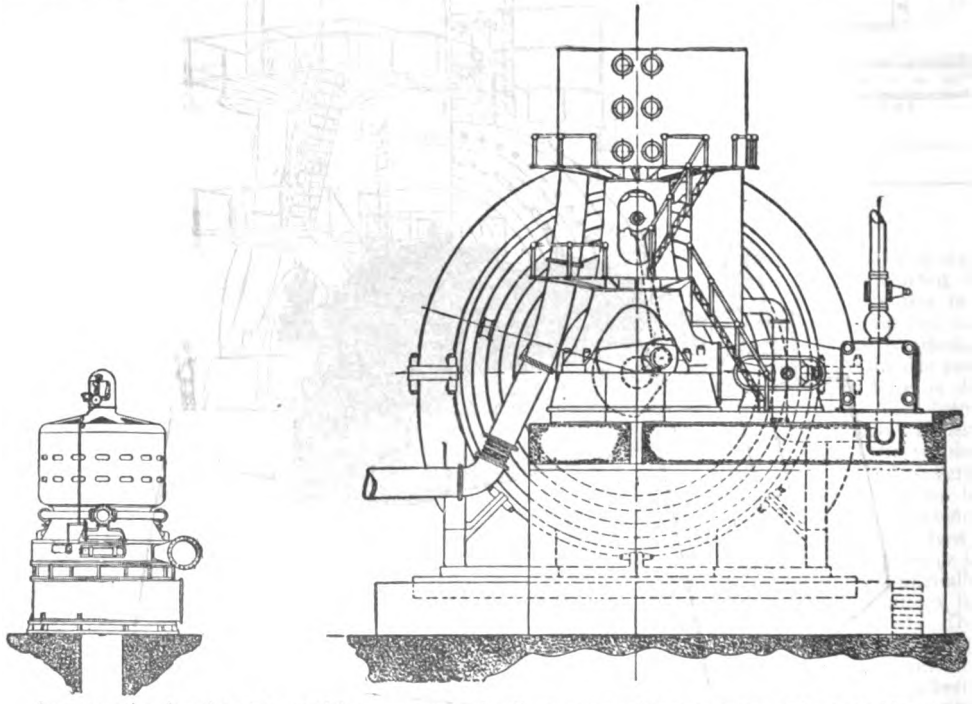


Comparative sizes of Turbine and Reciprocating Engines. (This outline shows a familiar type of vertical reciprocating engine, enclosing a Parsons turbine-generator unit of the same capacity).

The Multiple-Step Plan.— Geared motors are avoided by most engineers, and so the multiple-step steam-turbine was devised as a means for reducing the speed of rotation and driving machinery direct. This idea was first developed

by C. A. Parsons during 1884–87. The earliest Parsons parallel flow turbine was a collection of zigzag nozzles whose walls were formed by projecting rings of blades intermeshing and so arranged that the "zigs" were fixed to the inner circumference of a stationary hollow cylinder and the "zags" to the outer circumference of a rotable cylinder. The modern Parsons turbines from which such notably economical steaming results have been obtained differ from the earliest — apart from improvements in mechanical and constructional detail — only in the alteration of the contour of the steam passages or nozzles from a zigzag to a sinuous shape. Instead of turning sharp corners the steam now traverses flowing curves and the cross-sectional area of steam channels increases in nearly exact proportion to the growing volume of steam as it expands to the exhaust pressure, the collective areas at each stage fulfilling more closely the conditions for a perfect nozzle, as previously mentioned. But as expansion takes place both within fixed and moving blades, as the whole passage is one continuous nozzle, the clearances and workmanship must be of the finest to minimize leakage, which in the earlier machines caused serious trouble.

Professor Curtis of New York has designed large steam-turbines which follow Parsons' very closely in theory, but are differently worked out mechanically. Few revolving discs of comparatively large diameter are arranged, and the fixed steam nozzles only play upon part of their periphery, in some cases only two nozzles being employed on the first disc. Provision is made for altering the nozzle areas according to load by opening or closing their tapered walls, thus to a certain extent permitting correct maintenance of expansion ratios for varying steam pressures and loads. Professor Curtis argues that his arrangement of a few large nozzles and wheels in series lessens the percentage of waste through spilling of steam. In order to reduce the revolutions per minute as far as possible, Mr. Parsons appears to advocate a large number of turbines in series of small diameter, while Professor Curtis believes in few wheels of large diameter. Prof. A. Rateau of Paris has worked out a multiple step impulse steam-turbine, consisting of a number of Pelton or Laval wheels arranged in series on a shaft, each wheel revolving in a separate chamber. Distributing nozzles convey the steam to the wheel vanes, and the whole of the expansion is accomplished within the fixed nozzles. The steam leaves the chambers at almost the same pressure at which it enters, the wheel vanes merely receiving the impulse due to the velocity of the particles; there is, therefore, in this case no tendency to leakage and no necessity for clearance.



A comparative elevation of a 5,000 kilowatt steam-engine direct-connected to a generator, and a 5,000 kilowatt Curtis steam-turbine connected to a generator, showing economy of space.

The Dow Turbine.— The turbine invented by Dow is an inward-flow wheel with concentric sets of guides and vanes in series, and is said to have attained 35,000 revolutions per minute, working regularly at 25,000, consuming 45 pounds of steam per horse power per hour. The Dow turbine, as built for work in connection with the Howell torpedo, gives an average of about 11 horse power in coming up to speed in regular working, at 60 pounds steam-pressure, and weighs from 100 to 150 pounds, or not far from 13 pounds per horse power. Its fly-wheel rim attains a speed of nearly seven miles

a minute at 10,000 revolutions per minute. The designer estimates its power at 150 pounds steam-pressure and the same speed at 40 horse power, or one horse power to three and seventy-five hundredths pounds weight, and states that this may be still further reduced to the extraordinary minimum of two and one-half pounds weight per horse power, a figure within the estimated allowable maximum for use in aeronautic work. These engines have been successfully employed in driving electric machinery and in "spinning" the "fly" of the Howell torpedo. For alternating currents, this system possesses the peculiar advantage of permitting a "dynamo" to be employed having but two poles. In the United States the substitution of the Dow turbine for the system previously in use for spinning torpedoes has brought down the weight and volume of machinery from the earlier minimum of 360 pounds and three cubic feet per machine to 55 pounds and one cubic foot.

The Tesla Turbine.— About 1910 Nicola Tesla exhibited a remarkable 100 horse-power engine, so light that an ordinary man could hold it at arm's length. It was a steam turbine utilizing a new principle. He made a wheel of parallel circular plates about three-sixteenths inches apart and boxed it in, with apartments at the centre and the periphery. Admitting steam at the periphery in a tangential position, the steam rotated the plates by side friction, and continuing around in reducing spirals continued to give out its propelling face as its speed reduced. Thus it was doing the work of a multiple expansion engine with uniquely simple apparatus. The spent steam escaped at the centre. Though most wonderful in theory, this machine has not become commercially useful. See STEAM; STEAM-ENGINE.

TURBINE NAVIGATION. The application of steam-turbines (see TURBINE) to torpedo boats, destroyers and cruisers is to be anticipated from their unique capacity for developing great power and high speed with light and compact machinery. The conditions in a fast passenger steamer are favorable to the economical application of steam-turbines, and in such steamers the smoothness of their running will be a strong recommendation. C. A. Parsons, who has made remarkable developments in the steam-turbine, claims many advantages for the marine turbine engine. Among these many advantages he gives the following: (1) increased speed; (2) increased economy of steam; (3) increased carrying power of vessel; (4) increased facilities for navigating shallow waters; (5) increased stability of vessel; (6) increased safety of machinery for war purposes; (7) reduced weight of machinery; (8) reduced space occupied by machinery; (9) reduced initial cost; (10) reduced cost of attendance on machinery; (11) diminished cost of upkeep of machinery; (12) largely reduced vibration; (13) reduced size and weight of screw propellers and shafting. It may be said, generally speaking, that the larger scale on which the engines are made, the simpler is the construction, the higher the steam efficiency and the lower the speed of rotation.

The Turbinia Experiments.— In 1894 the steam-turbine had developed to such an extent that a syndicate was formed to apply the turbine to marine work, and a vessel, appropriately named the *Turbinia,* was built to develop high speed and to secure determinative measures of the value of steam-turbines in driving the screw-propeller. The first outcome of the experiment on the *Turbinia* was the discovery of a previously unsuspected cause of inefficiency at high speeds of rotation of the screw such as were adopted in this construction — "cavitation" by centrifugal action about the screw, which worked in a self-created cave in the midst of the water, throwing out the water faster than it could flow into the space by the action of gravity, even reinforced by the often still more active tendency to fill the vacuum thus caused. It was only when the speed of rotations of the screws had been reduced to 2,000 revolutions per minute, and after they were set in series of three on the same shaft, that the little boat made her famous run and attained a speed of 32¾ knots an hour, and later of 34½. The trials of the *Turbinia* were reported as follows:

"The mechanical friction of the turbines is particularly small, and the work spent on friction is not materially increased by increasing the range of expansion. This allows the steam to be profitably expanded much farther than would be useful or even practical in an engine of an ordinary kind. Apart from questions of friction the addition of weight and bulk to allow for this extended expansion would be enormous in the ordinary engine; in the turbine it is very moderate. Steam is expanded nearly 200-fold in the *Turbinia* and this is accomplished with engines which are much lighter than reciprocating engines of the same power, although in these the expansion would be much less complete. Rough weather was met with in some of the trials, but the *Turbinia* proved to be a good sea boat. The machinery worked with perfect smoothness, the screws did not race and the bearings remained perfectly cool throughout. From first to last during the whole of the trials, there was no hitch whatever or difficulty of any kind in the action of the turbine. Some 20 were made under various conditions as to speed, the range of speeds tested extending from 6¾ knots to 32¾ knots. Two successive runs on the measured mile in opposite directions in smooth water and at the slack of the tide gave the following data:

TRIAL OF TURBINIA.

Time on the mile, first trial, 109½ sec.; second trial, 110 sec.
Corresponding speed in knots, first trial, 32.79; second trial, 32.73.
Mean speed in knots, 32.76.
Revolutions per minute, of high pressure and intermediate shaft, 2,230.
Revolutions per minute of low-pressure shaft, 2,000.
Steam pressure in boiler by gauge, 210 pounds per square inch.
Steam pressure on admission to high-pressure turbine, 157 pounds per square inch.
Greatest pressure in stokehold by water gauge, 7½ inch.

The speed reached during this trial, 32.76 knots, in the mean was the highest recorded for any vessel. It is greatly in excess of the speed hitherto reached for a boat so small as the *Turbinia.* It is clear that the exceptional speed developed in the *Turbinia* has been achieved without sacrifice to economy, and that the substitution of turbines driving high-speed screws in place of reciprocating engines driving

screws of much more moderate speed is not attended with increased consumption of steam so far as fast running is concerned."

The Viper Destroyer.— The success of the *Turbinia* led to the construction in 1899 of a naval "torpedo-boat destroyer," *Viper*, and this craft, only 210 feet in length, of 375 tons displacement, developing 11,000 horse power, on 15,000 square feet of heating and 376 feet of grate surface, in water-tube boilers, with steam at 175 pounds by gauge; at 1,050 revolutions of the turbines, made over 37 knots, above 43 miles an hour. The contract speed was 35 knots. The turbines were two high and two low pressure, each driving a separate shaft carrying two propellers. The turbines were 35 and 50 inches in diameter. No vibration was produced by the engines, and the engine-room was so quiet that it was hardly possible to realize the presence of engines developing over 10,000 horse power. Here, as in all craft of the sort, the extraordinary performance in power production, once all is understood, is that of the boilers; that of a horse power for each one and one-half square feet of heating surface, and from each square foot of grate about 30 net horse power. This is probably the most extraordinary phenomenon in this or any other example of marine engineering. For warships of the destroyer class the absolute maximum of possible speed is the first thing to be desired, and the expenditure necessary to secure the extra speed is a matter of comparatively small importance.

The Turbine Passenger-Steamship.— In 1901 the turbine for passenger steamships was first adopted on the *King Edward VII*, a passenger steamer of a type in common use on the Clyde, built by William Denny Brothers of Dumbarton, Scotland. The builders, the Parsons Turbine Company and a captain of long experience in the Clyde passenger trade and the steamers by which it is carried, were all equally interested in the venture. To insure that accurate data on which the performance of the turbine might be obtained, the *King Edward* was modeled as nearly as possible of the same size and same general design as the paddle steamer *Duchess of Hamilton*, one of the crack steamers running on the route for which the *King Edward* was designed. The latter is, however, of slighter greater draft and more displacement. The weight of the motors, condensers, steam pipes, auxiliaries connected with the propelling machinery, shafting, propellers, etc., is 66 tons; which works out at about half the weight per indicated horse power of the engines required for paddle steamers of the same type. Another advantage secured to the boat by the adoption of the turbine engines is increased deck space for passengers.

Steam is raised in a double-ended Scotch boiler of the ordinary type, 20 feet long by 16 feet 6 inches in diameter. There are four furnaces at each end, made to work under forced draft with closed stokehold. For purposes of comparison, the capacity of the boiler under these conditions might be set down roughly at about 3,000 indicated horse power. It is, however, in the steam-turbine — the first engine to realize the dream of a perfect steam-driven rotary engine — that the chief interest in the craft is centred. The principle of the turbine is fortunately simple enough to make it easy of explanation. Inside the cylinder to which the steam from the boiler is led is a drum or hollow shaft studded with row upon row of blades or vanes, all set at an angle to the flow of the steam as the sails of a windmill are set to the breeze. It is apparent that the rush of steam deflected from its course by the first row of blades would not reach the next in such a directtion as would allow it to do its work effectively. To meet this difficulty there are, between each row of the working blades, a row of guide-blades fixed to the inside of the cylinder casing and set at the reverse angle. These blades are stationary and their sole purpose is to again alter the direction of the flow of the steam and bring it back to the straight course from end to end of the cylinder before it meets the next succeeding row of working blades. The tops of the revolving blades reach nearly to the outer casing of the cylinder and the stationary blades project inward until they almost scrape the revolving shaft or drum. A series of turbine wheels on one shaft are thus constituted, each one complete in itself, like a parallel-flow water-turbine; but, unlike a water-turbine, the steam, after performing its work in each turbine, passes on to the next, preserving its longitudinal velocity without shock, gradually falling in pressure on passing through each row of blades, and gradually expanding. There is no rubbing friction and no wearing parts except the bearings on which the main shaft or drum revolves.

Following are the net results of the comparative trials:

	Duchess of Hamilton	King Edward
Coal,	1,758 tons, 13 cwt.	1,429 tons, 16 cwt.
Mileage,	15,604	12,116
Miles per ton,	8.87	8.47
Number of days run,	111	79
Daily average consumption	15 tons, 17 cwt.	18 tons, 2 cwt.
Average speed,	16¼ knots.	18¼ knots.

The success of the *King Edward* was so pronounced that arrangements were at once made to construct other vessels of the same type, to be engined also with the steam-turbine. Larger and yet larger ocean-going vessels are being built and equipped with turbine engines, which have demonstrated their many advantages. See also STEAM VESSELS; STEAM-ENGINES

GARDINER D. HISCOX, M.E.

TURBIT, a breed of domestic pigeons, having a small flattened head and very short beak, a crest and a ruffled breast. The colors are various, but usually the body is white and the wings are colored.

TURBOT, a European flounder (*Rhombus maximus*), brown and speckled in color and usually weighing about 10 pounds, and exceptionally as much as 40 pounds, which is famous as a delicacy. It inhabits rather shallow waters in the Mediterranean and in the Atlantic, but is rare northward of Scotland. Like the other flatfishes it lies on the bottom concealed by sand with which it covers itself partly and seizes such small fish as approach, displaying much activity in their pursuit. It spawns during the spring and early summer and full-grown females deposit between 5,000,000 and

10,000,000 eggs. In the early stages of development the eggs are buoyant, but later sink to the bottom. The turbot is an important food-fish and much esteemed in England and on the Continent. Some are taken on hand-lines, but the bulk of the supply comes from the trawl-fishery in the English Channel. The nearest representative of the turbot on our Atlantic Coast is the window-pane flounder (*R. maculatus*), so called on account of its rhomboidal shape and a slight translucency, but this has very little value as a food-fish.

TURCHIN, tėr'chin, **John Basil** (IVAN VASILEVITCH TURCHININOFF), Russian-American soldier: b. province of Don, Russia, 30 Jan. 1822; d. Anna, Ill., 19 June 1901. After his graduation at the Artillery School, Saint Petersburg, in 1841, he entered the service as ensign, participated in the Hungarian campaign and afterward was graduated in 1852 at the military academy for officers of the general staff. After the Crimean War, in which he attained the rank of colonel of the Imperial Guards, he removed to the United States and adopted the profession of civil engineering. When the Civil War broke out he was commissioned colonel of the 19th Illinois volunteers and came to command a brigade under General Buell in Tennessee. He proposed a plan that proved successful in the capture of Huntsville and in recognition of this service he was made brigadier-general. After the war he returned to his profession as civil engineer. In 1873 he founded in Washington County, Ill., the Polish society of Radom. He contributed to scientific and military periodicals and wrote 'Military Rambles' and 'The Campaign and Battle of Chickamauga.'

TURCO-ITALIAN WAR 1911-12. Ever since the occupation by France of Algeria and Tunis in 1882, Italian statesmen had been more or less preoccupied with the question of Tripoli and Cyrenaica, the last remnants of Turkish dominion in Africa. On the northern coast of the Black Continent, that strip which belongs to Egypt was to all intents and purposes already British, though nominally still under Turkish suzerainty; French Algeria and Tunis stretched westward almost to Gibraltar, to the borders of Morocco. Only Tripoli and Cyrenaica were Turkish, wedged in between British and French boundaries. All that Italy possessed outside the homeland was a matter of 185,000 square miles on the east coast of Africa — Eritrea and Italian Somaliland, and the tiny concession at Tientsin, China. Her efforts to found an over-seas empire had not met with success; continually instigated by Bismarck to launch out in colonial enterprises wherever she might risk a collision with France or Great Britain, Italy had come to grief at Adowa in 1896. But she had coveted Tripoli long before the Abyssinian disaster. In 1890 Premier Crispi wrote privately to Lord Salisbury: "If we had Tripoli, Bizerta would no longer be a menace for Italy nor for Great Britain." It was suspicion of France, fostered by Bismarck, that had led Italy into what became known as the Triple Alliance; but that suspicion had died out in time and given place to a *rapprochement* between the two Latin nations. Bismarck had persistently refused to extend the Alliance to the Mediterranean, where Italy's chief interests lay. At the time Crispi wrote about Tripoli to Lord Salisbury, France and England were avowed enemies, hence Italy's aspirations had to follow the British statesman's advice, namely, to wait. Crispi fell in 1891, and the occupation of Tripoli waited for 20 years. The accession of M. Delcassé to the French Foreign Office in 1898 changed the history of Europe. He settled the Fashoda crisis with England, arranged a treaty of commerce with Italy and inaugurated that Mediterranean policy which led to the Anglo-French Entente, secured British establishment in Egypt, the French protectorate over Morocco and secret acquiescence (in 1901) to the Italian seizure of Tripoli. About 1902 Italy began to adopt a policy of "peaceful penetration" in Tripoli and Cyrenaica by founding a number of undertakings, commercial and industrial, throughout the territories. The Bank of Rome provided the capital to build grain elevators, electrical works, factories, etc., gradually securing a kind of mortgage on the province that might, if necessary, provide an opportunity for armed intervention. It was only a question of time that such opportunity should arise, for the Turkish authorities placed every possible obstacle in the path of economic development and made the most strenuous efforts to thwart the Italian ventures. All the undertakings languished, the invested capital remained unproductive and bankruptcy loomed on the horizon. Early in 1911 the manager of the Bank of Rome informed his government that he was preparing to enter into negotiations with an English and a German group of financiers, driven thereto in the interests of the shareholders (*Revue des deux Mondes,* 1 June 1912).

According to M. René Pinon, this undesirable prospect greatly contributed to the determination of the Italian government to intervene by force of arms if other measures should fail. There was another consideration that made it incumbent for Italy to hasten matters to a crisis. Germany, one of her partners in the Triple Alliance, was preparing to forestall her in the move on Tripoli, with the intention of acquiring a coaling station on the North African Coast. Public opinion in Italy was ripe for a military adventure; for some decades a kind of "nationalist" movement, headed by enthusiastic young officers and literary men, had gained many adherents to the tenets of imperialism and colonial expansion. On the other hand, there were many of the older type of Garibaldians who regarded the raid on Tripoli as an act of brigandage. From the beginning of September 1911 the position in Tripoli was hotly debated in the press, the Turks being accused of injustice to Italians and of intriguing with Germany. The Turkish transport *Derna* arrived at Tripoli on 26 September laden with guns and munitions. Italy delivered an ultimatum on the 27th giving Turkey 48 hours in which to accept the occupation of Tripoli by Italian troops and an Italian administration, with the proviso that the Sultan's sovereignty should be secured and an annual tribute paid by the new protectorate to the Porte. An Italian fleet was already stationed off Tripoli; an expedition under General Caneva set sail from Italian ports. On 29 Sept. 1911 Italy declared war, secure in the moral

support of the French and British governments. Tripoli was blockaded on the 30th; two days' bombardment easily smashed the Turkish defenses, and the city was occupied on 5 October. Though the attacking vessels were only three or four miles from the land, not one of the few Turkish shells that were fired struck anything. The Turks themselves sank the *Derna* and another small steamer. Including reserves, the Turks had about 8,000 men in Tripoli. The defenses of the town were old-fashioned, of concrete, equipped with obsolete guns. The enormous disparity between the feeble Turkish navy (of four battleships and two cruisers) and the powerful, modern Italian fleet rendered it most unlikely that Turkish reinforcements should be sent to Tripoli by water, and no other way existed. On 29 September Italian warships sank some Turkish torpedo-destroyers off Prevesa in the Adriatic, which led Austria to forbid any further operations in those waters, thus obliging Italy to restrict her naval campaign to the Tripolitan Coast and the Red Sea, the Ægean Sea being also barred. By the time the Italians landed in Tripoli the Turks had withdrawn 10 miles inland. Italian transports poured fresh troops on different parts of the coast, including 10,000 at Benghazi, which was captured on 20 October, and Derna on the 18th. The Italians expected that the Turkish troops would surrender and that the native Arabs would yield to the invasion, but both Arabs and Turks joined forces and fought valiantly. Around the town of Tripoli, which stands on a little peninsula, the Italians erected an entrenchment of about 10 miles facing the desert. Nesciat Bey, the Turkish commander, attacked through the oasis on 23 October; the Arabs behind the Italians in the suburbs suddenly attacked in the rear. The Italians were only able to save themselves after a long and desperate fight. On 26 October another attack took place, but was repelled with considerable Italian losses. On 5 Nov. 1911 the Italian Official Gazette published a decree declaring the annexation of Tripoli, which General Caneva read in the presence of the troops and the natives. The annexation was by no means complete, however, for the obstinate resistance of the Turks and the Arabs hindered the Italians from advancing very far from the coast. The Arab rising had been accompanied by hideous cruelties toward captured Italian soldiers; its suppression was marked by equally savage reprisals and a wholesale slaughter on the Italian side. Deplorable details were published by foreign newspaper correspondents together with photographs taken on the spot. Turkish officers by some means got into the country, reorganized the troops and soon took the offensive by continually harassing the Italian lines. One of the officers was Enver Bey, who afterward stated in a newspaper article, "I found 900 desert warriors when I came here, and now I have under me 16,000 trained soldiers." He said that on one occasion his little army had captured two machine guns, 250 rifles, two cannons, 30,000 cartridges and 10 mules from the enemy. In November 1911 the Italians made preparations to attack the Dardanelles, but the plan was vetoed by Russia. Early in November the Italians recaptured two positions which they had evacuated in October; and on 4 December forced the Turks to abandon their base at Ain Zara, which they fortified. On 19 December an Italian column narrowly escaped annihilation. By the end of the year the Italian press grew restive and inclined to blame Germany, Austria and France for the obstacles to Italian success. France and England were accused of upholding traffic in contraband of war, and energetic steps were demanded from the navy. In January 1912 the Italians had 100,000 men at the front; Enver Bey commanded about 15,000 Turks around Benghazi, and some 10,000 or 12,000 were located at Tripoli. Up to April the Italians remained on the defensive, repelling violent Turkish attacks. In January two French vessels were seized on suspicion of carrying contraband. France protested, and the vessels were released. During February and March the Italians captured several strong positions; near Benghazi the Turks were completely defeated and two small Turkish warships were sunk in the harbor of Beirut. Since January 1911 Turkey had been endeavoring to quell a rising in Yemen, and had for that purpose moved troops from Tripoli — before the Italian ultimatum — and sent them to Arabia. In January 1912 Italian warships entered the Red Sea, sank several Turkish gunboats and bombarded Jebel Tahr, Hodeidah and Loheia, besides dropping shells on various Turkish camps and hampering the Yemen operations by declaring a blockade of the coast. On 25 March 1912 the German emperor intervened in person by meeting the king of Italy at Venice. But his mediation proved fruitless, owing to Germany's double rôle as Turkey's protector and Italy's ally. In April an Italian force landed near the Tunisian frontier at Zuara and cut the main artery of the contraband smuggling business. An Italian squadron now approached the Dardanelles and bombarded the outer forts (18 April 1912). The Turks promptly closed the straits to all shipping, with remarkable consequences. The loss to Russian grain export quickly amounted to many millions. England, Bulgaria, Greece and Rumania lost some $100,000 per day each; British steamers, headed for the Black Sea, had to be diverted through the Suez Canal toward Indian markets; on 2 May 1912 there were 185 idle vessels anchored east and west of Constantinople. Yielding under powerful representations from European governments, the Turks reopened the Dardanelles on the 10th of May. On 5 May a strong Italian force landed at Rhodes, on the island of that name, occupied the capital and 10 days later compelled the Turkish garrison to surrender. They also occupied the islands of Neros, Karki, Stampalia, Piscopos, Scarpanto, Patmos, Casos, Kalminos, Karpathos, Kos, Lipsos and Simi. On 8 June the troops in Tripoli defeated a Turco-Arab force at the oasis of Zanzur and on the 15th General Camerana attacked near the oasis of Misrata, which was taken in July. Heavy fighting took place on the western frontier during June, July and August. By slow degrees the Turks and Arabs were driven back until the whole western coast-line was in Italian hands. On 5 Sept. 1912 General Caneva was recalled and two separate commands were formed for Tripoli and Cyrenaica. During the night of the 12th July five Italian torpedo-boats en-

tered the Dardanelles to attack the Turkish fleet lying above the Narrows. But the entrance to the Narrows was barred by thick steel cables at Kilid Bahr and they had to retire under heavy fire from the shore batteries. This was the last naval operation of the war. In September it leaked out that peace negotiations between Italy and Turkey were in progress under a veil of mystery in Switzerland. Each side was anxious to end the war: Turkey, to prepare for another war that hung over her head, and Italy, to recover her freedom of action in Europe. Meanwhile, fighting continued in Tripoli. On 22 September a strong Turco-Arab position south of Zanzur was attacked and captured. During the middle of the month Enver Bey attacked the Italian positions at Casa Aronne and Kasr-el-Lebn in Cyrenaica. In a fierce battle the Turks were repulsed with heavy loss. A few miles eastward the Italians stormed Sidi Abdullah and occupied Bombah on 7 Oct. 1912. On the next day Montenegro declared war on Turkey — the overture to the Balkan Wars (q.v.). On the 12th a hitch occurred in the peace negotiations. Italy was preparing for further naval operations, and for the moment it seemed that she would become an ally of the Balkan League (q.v.). Turkey needed peace with Italy at all costs to prevent this; besides, Italian command of the Ægean hindered Turkey from sending troops to Macedonia. The Italian terms were accepted in full and the Peace of Lausanne was at last signed at Ouchy on 15 Oct. 1912. Turkey bound herself to withdraw her troops from Tripoli, but did not recognize the sovereignty of Italy; she was to have a representative to watch over the interests of Mohammedans in Tripoli. On her side, Italy was to restore all the captured Ægean Islands, on condition that a full amnesty should be granted to their inhabitants, and their autonomy respected: she was to pay that part of the Ottoman Public Debt which is guaranteed by revenue from Tripoli and Cyrenaica. Consult Irace, Chevalier Tullio, 'With the Italians in Tripoli: The Authentic History of the Turco-Italian War' (London 1912); Fullerton, W. M., 'Problems of Power' (London 1913); McCullagh, F., 'Italy's War for a Desert' (Chicago 1913)

TURDIDÆ, Turdus, the family and genus of the typical thrushes.

TURÉNNE, Henri de la Tour d'Auvergne, ŏñ-rĕ dĕ lä toor dō-värn-y tü-rĕn, VICOMTE DE, French commander: b. Sedan, 11 Sept. 1611; d. Sasbach, 27 July 1675. He learned the art of war under his uncles Maurice and Henry of Nassau, and in 1630 entered the service of France. In this service he distinguished himself in Lorraine and northern Italy, and in December 1643 he received from Mazarin the command of the army of the Rhine. In August 1646 he succeeded, by a series of skilful maneuvers, in forming a union with the Swedes under Wrangel, and along with him defeated the Bavarians at Zusmarshausen, and compelled the elector to agree to a truce (March 1647). During the disturbances of the Fronde, which began in 1648, he at first sided with the malcontents; but after the death of his elder brother he changed sides, and defended the court against the Prince of Condé, who had previously been the main support of the court party. The victories of Turenne at Bléneau on the Loire (April 1652), and in the suburb of Saint Antoine at Paris (July 1652), led to the termination of the civil war and the complete triumph of the court party; but during these disturbances the Spaniards had taken up arms, and now under Condé, who was so exasperated with the court that he joined the enemies of France, invaded Artois. Turenne was sent to repel the invasion, and gained a victory at Arras in 1654. But the war was prolonged for several years. At last his victory on the downs near Dunkirk in 1658, and the capture of Dunkirk itself in the same year, prepared the way for the Peace of the Pyrenees, which was concluded in the following year. In 1660 he was named marshal-general of the camps and armies of France. When the war was renewed with Spain in 1667 Turenne conquered Flanders in three months, and in the following year subjugated Franche-Comté in as many weeks. In the Dutch War of 1672 he had the chief command and earned greater renown by his exploits during this war than in any other. Turenne first marched against the elector, Frederick William of Brandenburg, and having driven him back as far as the Elbe forced him to sign the Treaty of Vossem in 1673. In the winter campaign of 1674–75, which was signalized by the victories of Sintzheim, Mulhouse (1674), and Turkheim (1675), he delivered Alsace, which had been given up for lost by the minister of Louis XIV, from the imperial troops. This is the most brilliant campaign of his whole career. He was killed at Sasbach while making his preparations to engage Montecuculi.

TURFAN, toor-fän', Eastern Turkestan. an important city on the south slope of the Tyan-Shan Mountains and on a tributary of the Tarim River. Its once important trade declined seriously in 1860–70 owing to the troubles in Kashgar. Pop. 30,000.

TURGAI, toor-gī'. Russian Central Asia, a sparsely populated district lying south of the government of Orenburg, and north of the Aral Sea. Area, 169,832 square miles. Pop. 706,200. It is traversed in the west by the southern extremity of the Ural Mountains. The rest of the country is steppes inhabited by Kirghiz and their herds.

TURGÉNIEF, Iván Sergyéyevitch, Russian novelist: b. Orel on the Oka, 9 Nov. 1818 (N. S.); d. Bougival, 3 Sept. 1883. He belonged to an old aristocratic family. One of his ancestors, Pyotr Turgénief, was executed on the Lóbnoye Myésto in Moscow for attempting to unmask the False Dmitri. Another, Yákof Turgénief, was the famous jester of Peter the Great, who suggested cutting off the patriarchal beards of the Boyars. Iván's father, Sergyéï Nikoláyevitch, was a member of the Yelisavyetgrad regiment of cuirassiers serving at Orel, where he married Varvára Petróvna Lutvínova, and retired with the rank of colonel. In 1820 he took his wife and three sons to western Europe. At Bern, when about four years old, Ivan narrowly escaped the fate of the children that mocked Elijah: he was looking at the bears and if his father had not seized him by the leg in time he would

have tumbled into the pit. On returning to Russia he was given the usual education of wealthy landowners. He always regretted that his native language was not included in the curriculum. What he learned of Russian poetry and legend came to him by the mouth of one of his mother's serfs who introduced him to the 'Rossiad,' the first Russian book he ever read. In 1828 the Turgéniefs removed to Moscow and Iván entered the university when he was 16, but in 1835 he was transferred to the University of Saint Petersburg, where he finished his studies as Kandidat in the department of philology. He had already felt the impulse to write, and he tells in his 'Recollections' how in 1837, under the eye of Professor Plétnyef, he composed "one of the first fruits of his Muse, a fantastic drama in pentameters, entitled Sténiya, and childishly imitative of Byron's 'Manfred.' The professor, without mentioning its author's name, read it in class and afterward meeting him in the street assured him that there was "something in him." This encouraged him so much that he took to Plétnyef some of his other verses, two of which were printed in the *Sovereménnik* (*Contemporary*). One of them was entitled 'The Old Oak.' In 1838 he went to Berlin, under the illusion that real education was to be obtained only abroad. There he spent about two years, studying philosophy, ancient languages and history. Hegel had a great influence on him. Thus he, as it were, cut himself off from Slavic influences and became a westerner, which, as he himself said, he always remained. On returning to Russia, he went directly to Moscow, where lived his mother, a stern, autocratic and even violent woman. There are many dreadful stories of her cruel treatment of her serfs. He made the acquaintance of the leaders of the Slavophile movement — Aksákof, Khomyákof and others, but he did not sympathize very cordially with them. In 1843 he published a narrative poem, entitled 'Parasha by T. L.'. "With that poem" he says in his 'Recollections,' "I entered the arena of literature." Byelinsky, the great critic, reviewed it most favorably in *The Annals of the Fatherland,* and Turgénief declared that the praise caused him more confusion than pleasure; and when Kiriyévesky congratulated him on it he denied being its author. Turgénief, judged by his one small volume of verses, was well-advised when he took to prose exclusively as his literary expression. His first notable work in fiction was the volume of short stories, entitled 'Zapiski Okhótnika' ('A Sportsman's Recollections or Sketches') which were written between 1841 and 1850. With no attempt to preach, they had almost as powerful an effect in stimulating public dissatisfaction with serfdom as Gogol's 'Dead Souls.' The authorities could not find anything to suppress in these artistic subtle delineations of country life on the great estates; but when Turgénief wrote an eloquent eulogy on Gogol and published it in the *Moskóvskaya Vyédomosti* in March 1852, he was subjected to a month's imprisonment and then banished to his estate, where he spent two years — a punishment which he regarded as a blessing in disguise. His literary activity became very prolific. He published 'Dmitri Rudin' (1855); 'A Nobleman's Nest' (1858); 'Fathers and Children' (1862), to mention three of his greatest novels. In each of them he marked an advance in art and won a wider reputation, which was even more generously accorded abroad than in Russia, where his somewhat cynical presentation of "types" was more or less resented. In 1863 he bought a stately house in Baden-Baden, where he lived until 1870. After the Franco-Prussian War he lived mainly in Paris, where he was on terms of intimacy with Madame Viardo. Several of his novels he wrote first in French. In the long list of his other works may be mentioned 'Two Friends' (1853); 'Quiet Life' (1854); 'Faust' (1856); 'Asya' (1858); 'First Love' (1860); 'Hamlet and Don Quixote' (Essays, 1860); 'Visions' (1863); 'The Brigadier' (1866); 'Smoke' (1867); 'A Strange Tale' (1869); 'A Lear of the Steppes' (1870); 'Spring Floods' (1872); 'Virgin Soil' (Or "New" *Nov*); 'Song of Triumphant Love' (1881); 'Poems in Prose' (1882). A fuller bibliography is given in William Lyon Phelps' 'Russian Novelists.' Turgénief was a man of stately presence and courtly manners, a genuine cosmopolitan. He died of cancer of the spine. Besides many translations of individual works there are in English two fairly complete editions of his novels: one by Isabel F. Hapgood; the other by Constance Garnett. A more consummate artist than Tolstoy, his fame and popularity have been in the last few years rather overshadowed by the more vital personality of the Apostle of non-resistance. See FATHERS AND CHILDREN: LEAR OF THE STEPPES, A; SMOKE.

NATHAN HASKELL DOLE.

TURGITE, tėr'jit, a common iron ore much resembling limonite, with which it is usually associated. It is distinguished from that by its red streak, higher specific gravity, 4.14 to 4.68, and by its violent decrepitation when heated. It usually occurs in compact-fibrous, often botryoidal or stalactitic coatings on the surface of limonite. It then possesses a brilliant submetallic lustre on the outer surface and a much duller, satiny lustre on the broken fibrous surfaces. Its color is black or dark brownish-red; hardness 5 to 6. Its most typical American locality is in Salisbury, Conn. It also occurs in an earthy form like red ochre.

TURGOT, tür-gō, **Anne Robert Jacques,** French statesman: b. Paris, 10 May 1727; d. there, 20 March 1781. In 1751 he renounced his intention of entering the Church, and in the end of the following year he was admitted a councillor of the Parliament. While fulfilling the duties of this position he also occupied himself with economical studies, and made himself well acquainted with the physiocratic system of Quesnay. In 1761 he was appointed intendant of Limoges, which post he occupied for 12 years, and was long remembered with gratitude for his wise, salutary and benevolent reforms and regulations. On the accession of Louis XVI in 1774 Turgot was first put at the head of the marine; but a few months later he became comptroller-general of France. He moderated the duties on articles of the first necessity without loss to the revenue; freed commerce from many fetters, and encouraged industry by enlarging the rights of individuals, and abolishing the exclusive privileges of companies and corporations. He

also formed a project for commuting the feudal rights, for rendering salt an article of free merchandise, and for reforming the royal household. His reward for these useful and benevolent views was opposition and ridicule. He was, however, able to carry into effect some very important improvements; but as he endeavored to control the nobility, restrict the clergy, and restrain the license assumed by the officers of the Crown, they all united against him. The result was his dismissal from office in 1776, from which period he lived a retired and studious life until his death.

TURIN, tū'rĭn, or **TORINO,** tō-rē'nō, Italy, capital of the province of the same name, on the Po, 75 miles southwest of Milan. Its position at the junction of several Alpine mountain routes lends it much military importance. It is a large military station, directed toward the defense of the western highways over the Alps. It contains numerous fine squares of *Piazzas*, chief of which is the Piazza Vittorio Emanuele, unsurpassed on the Continent; Piazza Carlo Emanuele II or Carlina; and others, usually embellished by equestrian statues or busts of distinguished men. The Nuovo Giardino Pubblico, along the river, botanical garden, Giardino della Citadella, Giardino Reale and zoological garden are interesting parks. The Renaissance cathedral (1492–98) has a marble façade and contains the tombs of the Dukes of Savoy. Other churches are the Consolata, San Spirito, San Massimo, Gran Madre di Dio, a Moorish synagogue, and a Waldensian church. La Superga is a fine Basilica on an eminence overlooking the town. It is the burial chapel of the House of Savoy. The chief palaces are Palazza Madama, Carignano,— with natural history collections — Palazzo di Città, or town hall — containing a library and monuments — Palazzo Reale, or royal palace, with a royal armory, Palazzo dei Torri, Palazzo del Accademia delle Scienze, with a fine collection of antiques and a picture gallery, etc. The museums and Accademia Albertina delle Belle Arti, the exchange, arsenal, university (1404), theatres, hospitals and numerous schools are the other important edifices. One of the best libraries of Europe is housed in the Biblioteca Nazionale. The Royal Albertine Library of 60,000 volumes and 3,000 manuscripts is also located here, and there is a municipal library of 104,000 volumes. Manufactures are important and consist of silks, jewelry, furniture, pianos, gloves, leather, paper, iron and steel goods, soap, tobacco, machinery, and velvet hats; silk and wine are exported. Turin was the capital of the modern kingdom of Italy until 1865; it was the ancient capital of the Taurini, a native tribe of Celto-Liguarians, and was the seat of government under Charlemagne until 1032. The French captured the town in 1640 and in 1800 annexed it. In 1815 it was restored to the House of Savoy. Pop. 451,994. Consult Borbonese, 'Torino illustrata e descritta' (Turin 1884), and Promis, 'Storia dell antica Torino' (ib. 1871).

TURIN, University of, Italian school founded by Louis of Savoy (1405). Toward the latter part of the 15th century it shared the prosperity of the period. It was reorganized in 1632 and the present building was erected in 1713. The university has faculties of law, medicine and surgery, philosophy and letters, and physical and mathematical sciences. There is an average annual attendance of over 2,000 students.

TURK ISLANDS, British West Indies, a group of small islands lying at the southeastern extremity of the Bahamas, north of Haiti, but forming, with the neighboring Caicos Islands, a dependency of Jamaica. The area is 165½ miles. Grand Turk, the principal member, is seven miles long, but the Caicos Islands are larger. The chief product is salt. Pop. 5,615, of whom 286 are white. Education is free in the government schools, of which there are nine of primary grade, with an enrolment of 1,030, and an average attendance of 794 pupils. The total imports annually amount to about $150,000 and exports somewhat less. There is a cable station at Grand Turk. See CAICOS ISLANDS.

TURKESTAN, toor-kĕs-tăn', Central Asia, the general name given to the region lying between Mongolia, China and Tibet on the east and the Caspian Sea on the west. It is divided by the Mustagh range and a southwestern outrunner of the Tyan-Shan Mountains into East or Chinese Turkestan and West or Russian Turkestan.

EAST TURKESTAN is bounded on the north by Sugaria, on the east by Mongolia and China, on the south by Tibet and India, and on the west by Western or Russian Turkestan. Area, 550,340 square miles. It consists of a desert plateau basin skirted by the Tarim River, and encircled on all sides by mountains — on the north by the Tyan-Shan, on the south by the Kuen-Lun, and on the west by the Pamir highlands. Agriculture is carried on only in the oases and in irrigated districts along the river, where cotton, tobacco and hemp are grown. The chief exports are silver, silks, felts, carpets and cotton. East Turkestan belongs administratively to the Chinese province of Sin Kiang. Pop. 1,200,000.

WEST TURKESTAN in its widest sense includes the entire southwestern portion of Asiatic Russia. It consists of the states of Khiva and Bokhara in the south, the general government of the Steppes in the north, and the general government of Turkestan, or Russian Turkestan proper. The latter reaches from the Chinese Empire to the Caspian Sea, and consists of the districts or provinces of Samarkand, Fergana (with Russian Pamir), Semiryechensk, Syr-Darya, and the Trans-Caspian region. Area, 649,644 square miles; exclusive of Trans-Caspia, 409,414 square miles. The extreme eastern and southeastern parts are mountainous, but the greater portion consists of vast arid steppes traversed by the rivers Amu and Syr Darya which flow into the Aral Sea. Only the irrigated portions along the rivers can be cultivated; they produce wheat and rice in great quantities, besides melons, grapes, fruits and cotton. The nomadic inhabitants of the steppes are engaged in cattle raising. Wheat, raw cotton and cattle products are the principal exports, and trade has been greatly facilitated by the completion of the Trans-Caspian Railroad. The capital of the general government is Tashkent and the pop. about 5,300,000; exclusive of Trans-Caspia, 5,000,000.

TURKEY, a river in northeastern Iowa. It flows southeast and enters the Mississippi in

the southeastern part of Clayton County. The Galena limestone is found in the Turkey River Valley. The river is about 100 miles long.

TURKEY, an American game-bird of the pheasant family and genus *Meleagris,* widely known both wild and domesticated. The common northern wild turkey (*M. gallapavo*) formerly inhabited almost all parts of the United States and southern Canada and southward through the greater part of Mexico; it is now numerous, however, only in thickly wooded mountainous and inaccessible regions. It is a very beautiful bird of trim form and stately mien and the cock is colored with golden bronze hues, marked and varied by the blue and black lustre of the plumage. A peculiar tuft of hair-like feathers is suspended from the breast, and the head and neck are furnished with wattles and erectile structures, which under excitement exhibit varying tints and hues. The wild turkey is a bird of the forests, where it lives in small flocks which enter clearings only to feed. They are eminently terrestrial, being swift of foot, and they scratch on the ground for the nuts, seeds, insects, etc., upon which they feed or pick berries and small fruits from the bushes. When pursued they prefer to run and seek concealment in the underbrush but if forced to fly are strong of wing. At night they roost in the tops of trees and are always keen-sensed and alert. Like most of the pheasants turkeys are more or less polygamous and in the spring the cocks fight viciously for the possession of mates, before whom they show off in the pompous and ludicrous manner so well known in the domesticated bird. A simple nest on the ground, often by the side of a log, is made and lined with dry leaves; in it from one to three females deposit from 10 to 25 eggs, which are dirty white with reddish spots. Only one brood is raised in a season unless accident overtakes the first.

Although formerly so abundant and so tame that the early settlers found the neighboring forests almost as convenient as poultry yards, few persons have now the opportunity of shooting a wild turkey, but any such are events in the life of a sportsman, for success requires both skill and knowledge. The method most in vogue is for the concealed hunter to attract the birds to him by imitating their call upon a turkey whistle and to shoot the wary birds as they appear. This method is most effective when the hen's call is employed to attract the cocks. They are also hunted with dogs or even stalked.

The domesticated turkey is derived from the Mexican variety, examples of which were carried to Europe in the early part of the 16th century; but it is possible that the strain may have been mixed in England with northern birds. The latter were partially domesticated by the Indians and New England settlers. The domesticated turkey has lost the grace, agility and brilliancy of color of its progenitor, but in other respects has been but little modified. In habits it is indeed still a half wild creature. In the four centuries of its domestication it has remained remarkably stable and except in color no distinct varieties have been produced. Of its habits, appearance and merits nothing need be said. The young of the domesticated turkey require especial care for the first five or six weeks of their existence.

The beautiful Central American ocellated turkey (*M. ocellata*) is of rather less size than the common turkey, but more brilliantly colored. This species lacks the tuft of hairy feathers seen on the breast of the other and derives its specific name from the presence of brilliant eye-like spots on the tail-coverts.

Consult Baird, Brewer and Ridgway, 'North American Land Birds,' Vol. III (Cambridge 1872); Darwin, 'Animals and Plants under Domestication,' Vol. I (New York 1868); McGrew, T. F., 'Turkeys: Standard Varieties and Management' (United States Department of Agriculture, Washington, D. C., 1915); McIlhenny, E. A., 'The Wild Turkey and its Hunting' (Garden City 1914); id., 'Turkeys, Waterfowl and Guineas' (Mountain Grove, Mo., 1914); Sandys, 'Upland Game Birds' (New York 1902).

TURKEY, or THE OTTOMAN EMPIRE (MEMALIK I OSMANIE), an empire consisting of territory in the peninsula of Asia Minor and southwestern Asia, and also a portion of southeastern Europe in the vilayets of Adrianople, Chatalja and Constantinople, and in Asia, Arabia, Syria, Palestine, Mesopotamia and Kurdistan (qq.v.). The end of the first Balkan War in November 1913 saw Turkey's European territory considerably curtailed, its former holdings being in part divided between Bulgaria, Greece, Montenegro and Serbia. This loss of territory was inconsiderable compared with that which was ordered by the Paris Peace Conference after Turkish arms had gone down to defeat in October 1918. For these territorial changes see WAR, EUROPEAN — PEACE TREATIES. The Ægean

VILAYETS	Area square miles	Population
Europe:		
Constantinople	1,505	1,203,000
Chatalja (" Independent " Sanjak)	733	78,000
Adrianople	8,644	610,000
Asia Minor:		
Ismid (" Independent " Sanjak)	3,130	222,700
Brussa	25,400	1,626,800
Bigha (" Independent " Sanjak)	2,550	129,500
Smyrna, or Aidin	25,801	2,500,080
Kastamuni	19,570	961,200
Angora	27,370	932,800
Konia	39,410	1,069,000
Adana	15,400	422,400
Sivas	23,970	1,057,500
Trebizond	16,671	1,265,000
Armenia and Kurdistan:		
Erzerum	19,180	645,700
Mamuret-ul-Aziz	12,700	575,200
Diarbekr	14,480	471,500
Bitlis	10,460	398,700
Van	15,170	379,800
Mesopotamia:		
Mosul	35,130	500,000
Bagdad	54,540	900,000
Basra	53,580	600,000
Syria:		
Aleppo	33,430	1,500,000
Zor (" Independent " Sanjak)	30,110	100,000
Syria	37,020	1,000,000
Beirut	6,180	*533,500*
Jerusalem (" Independent " Sanjak)	6,600	341,600
Lebanon	1,190	*200,000*
Arabia:		
Yemen	73,800	750,000
Grand total	613,724	*20,973,900*

Islands are in possession of Greece and Italy. Cyprus and Egypt, which until recently were under the suzerainty of the Sultan, are now under the British flag — the former being annexed in November 1914 and the latter made a British Protectorate in January 1915. The total area of Turkey's present dominions may be estimated at about 613,700 square miles with a total population of about 20,975,000. Yemen and Hedjaz became independent states during the war.

At the time Turkey entered the war on the side of the Central Powers in 1914 her area and population were as shown in table on preceding page.

Topography.— Former European Turkey formed a peninsula bordered by the Black and Marmora seas, the Bosporus and Dardanelles on the east and south, on the southwest it was bounded by the Ægean Sea, of which the only important indentation in this region is the Gulf of Saros. Its northwestern boundary is the Maritza River and its northern the frontier of Bulgaria. There are no great elevations in this region. Near the Bosporus Devonian formations are in evidence but away from the coastal hills stretches a plain of comparatively recent formation, the principal part of which is the valley of the Maritza in which there are few points over 600 feet above sea-level.

Asiatic Turkey is bounded on the north by the Black Sea, on the east by Persia, south by Mesopotamia and the Mediterranean and west by the Ægean Sea. The coast line is regular except in the vilayets of Bigha and Brussa, which have numerous indentations and are fringed with thousands of islands. The Taurus and Anti-Taurus ranges extend through Turkey from Persia to the Ægean Sea, and in many places send out short spurs which on the south slope to the plains, but end abruptly on the north.

Hydrography.— The chief river of Turkey in Europe is the Maritza (the ancient Hebrus), which enters the Ægean Sea near Enos. Adrianople is situated on its banks. It was on the bank of this river, near Adrianople, that, in 1364 occurred the battle between the Christians and the Turks, which resulted most disastrously for the Christians. The Kizal-Irmak (Red River), the largest stream in Asia Minor, is about 600 miles long. It flows in a north by east direction into the Black Sea. The Mendere (the ancient Mæander) flows into the Ægean.

Geology and Mineralogy.— The southeastern part of European Turkey belongs geologically to Asia. Devonian rocks are found on both sides of the Bosporus, and the similarities are multiplied by the fossils, the rock layer, the appearance of the river beds, and the nature of the soil and stone. Lava of considerable depth covers a large portion of the plains of Asia Minor. The marks of violent upheaval and of volcanic action abound. The mountains of Turkey are rich in minerals, but mining is yet in a crude condition. Meerschaum is found at Eskisheh, in Asia Minor, and copper, lead, coal, antimony, rock salt, emery, alum, nitre, iron ore and chalk abound in many places. A valuable lithographic stone is quarried near Brussa. A royalty of from 5 to 15 per cent is paid on all minerals which are exported from Turkey.

Climate.— The climate of Turkey in Europe is about the same as that of the countries in Europe which border on the Mediterranean; but radical changes occur frequently. The cold northeast winds which sweep down from the frigid regions of Russia modify greatly the climate of the north and south valleys. In the northern portions of Asiatic Turkey the winters are cold and humid; in the sheltered valleys the climate is comparatively uniform and warm. The rainless season is from April to September but the heavy dews furnish a large amount of moisture The highest peaks of the Taurus Mountains are covered with snow all the year.

Flora and Forests.— On the lowlands of Turkey in Europe, and on the lower slopes of the mountains, are found a variety of evergreen trees, box, myrtle, palms, sycamore and also walnut, almond and carob trees. The grape-vine and the citron flourish on the eastern and southern slopes and in the valleys. The roses from which the celebrated «attar of roses» is distilled grow in abundance on the plain of Adrianople. Many of the flowering plants of Asiatic Turkey belong to the same families as those in European Turkey, but they differ in genera. On the lower slopes of nearly all the ranges are found cedar, cypress and oak trees. On the plains are large groves of mulberry and sycamore, and in the valleys are grape-vines, groves of orange, olive, fig, pomegranate and many nut-bearing trees. Some of the interior plains are almost treeless and a large acreage is used for pasturage. Grasses, sage, wormwood and broom grow on those plains. South of Armenia the grape-vine, lilac and jasmine are features. A species of maize grows wild on many of the warm lowland regions.

The forest laws (recent) are modeled after those of France; but no restrictive laws are enforced, and Turkey is being rapidly deprived of timber.

Fauna.— The principal wild animals of European Turkey are the dog, cat, boar, badger, bear, civet, squirrel, chamois, roe, deer, beaver, mole, hedgehog, wolf, marten, fox, hare and bat. Fish are found in large quantities and in nearly all the waters. Coral and sponge fisheries are extensive. Leeches exist in the marshes. There are over 240 species of birds of which about 100 are songsters. In Asiatic Turkey the striped hyena, lion, bear, jackal, wolf and wild boar are fairly numerous, and the hare, hedgehog, jerboa, leopard, mole and wolf, abound in certain regions. The domestic animals are the horse (the camel is more common), ox, ass, goat and sheep. A famous species of goat is found in Angora (q.v.). The buffalo supplants the ox in many parts of Asiatic Turkey. The bee and the silkworm are raised in many sections, but especially in the southwestern part of Asiatic Turkey.

Soil and Agriculture.— The greater part of the lowland region of Turkey in Asia has a most productive soil, but lack of moisture makes some portions almost a desert. Irrigation has reclaimed certain localities. The chief occupations in all of the Ottoman Empire are agriculture and cattle raising, yet agricultural

methods are most primitive, and only a small portion of the arable land is under cultivation. Agricultural development is retarded by the system of levying tithes on all the produce, and by the internal custom dues which oblige the farmer to pay a fee on all produce exported from one province to another.

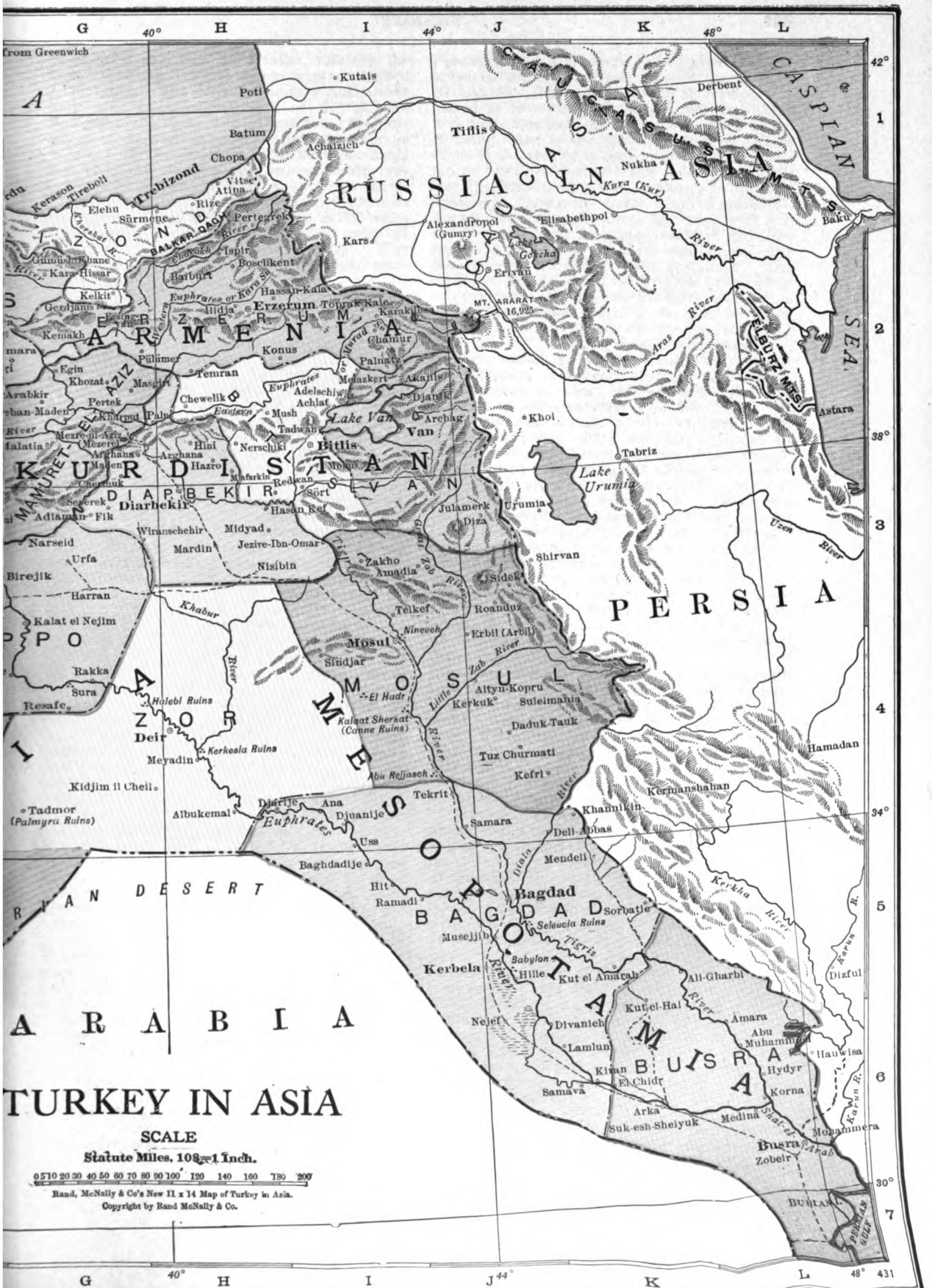
The land is held under four different forms of tenure: (1) "Miri," or Crown lands; (2) "Vacouf," or pious foundations; (3) "Mulikaneh," or Crown grants; (4) "Mülk," or freehold property. The Crown lands form the largest portion and are held directly from the Crown. The government grants permission to cultivate an unoccupied tract and in return exacts a certain fee; but continues to exercise the right of seignory over the rented land. If the lessee neglects to cultivate the land for three years in succession, it reverts to the Crown, and again becomes "unoccupied land." The "Vacouf" lands were instituted originally to provide for the maintenance of the religion of the state and for the education of the people. These lands are now mostly in possession of government officials. The "Mulikaneh" lands were granted to the old feudal troops as a reward for military services. The title to such lands is hereditary, and the land is exempt from tax. The freehold lands do not exist to any great extent, but some of the peasants have purchased "Mülk" lands from the government. Two other categories of land are recognized in law — land set aside for community use (*metruké*) and "dead" or unutilized land (*mevat*). The entire body of law in regard to real property is antiquated and in urgent need of revision and codification. A beginning in this direction was made in 1913 and again in 1918, under enactments providing for a general survey and revaluation of all landed property in the empire, together with a readjustment of taxes; for corporations to hold real estate in the name of the corporation; for the mortgaging of property as security for debts; for the suppression of *guedik* (guild) property; and for the extension of the right of inheritance. The farmers produce but little more than is required for their own use, on account of the system of levying tithes on all farm produce and the exportation taxes on all produce sold and exported to other countries, or to different parts of their own country. The system of levying these taxes is burdensome and oppressive, the general practice being to farm it out to contractors.

Agriculture is carried on in a most primitive fashion. The soil is in general very fertile; the principal crops are tobacco, a world-famous product, cereals of all kinds, cotton, figs, nuts, almonds, grapes, olives, all varieties of fruits, coffee, madder, opium and various gums. There are 16,567,775 acres under cultivation as follows: 13,689,474 under cereals; 473,085 acres under fruits and vegetables; 779,982 acres under cotton, flax and other industrial crops; and 1,213,530 acres under vines. Coffee is grown in the Hodeida region; Konia is the principal centre of opium production; while tobacco is fairly widely distributed. There are about 18,000,000 acres under forest. The forest laws are patterned after those of France, but their enforcement is very lax and the country is being denuded rapidly of its timber. Pine, larch, oak, fir and the cedars are the more important timber trees. Mulberry plantations are on the increase and the silk-worm industry is being revived. The product is largely marketed in France. A recent livestock census showed 2,397,348 horned cattle, 163,691 buffaloes and 30,942 pigs in Turkey.

Manufacturing and Other Industries.— The manufactured products are mostly hand made. Although there is an abundance of raw material, manufacturing has declined since about 1850. The carpets for which Turkey was once famous, the woolen goods of Macedonia (now itself lost to the empire) and other products, have in almost all parts of the empire been undersold by the machine products of other countries. A few glass factories and several paper mills have been established. Turned-brass and beaten-copper utensils for household purposes are made by hand. There are a few steam manufactories in Constantinople. The government operates cloth mills at Kara-Mursal and Ismid in which modern machinery has been installed. The chief output has been khaki woolen cloth for the use of the army. There is a woolen yarn-spinning works at Panderma, which employs 140 wage-earners and turns out 2,750,000 pounds of yarn annually. Fishing is an important industry; the fisheries of the Bosporus alone have an annual value of over $1,250,000. The methods of fishing are most primitive. The sponges obtained along the Mediterranean rank with the best in the world. Pearl is obtained from the Persian Gulf and mother-of-pearl from the Red Sea.

Transportation.— The length of railroad line in Asiatic and European Turkey on 1 Nov. 1914 was as follows: In Europe (miles open only): Salonicâ-Monastir, 136 miles; Constantinople-Salonica, 317 miles; Oriental railroads, 593 miles, or a total of 1,046 miles in European Turkey. In Asia: Haidar-Pasha-Angora, 358 miles; Eski-Shehir-Konia, 283 miles; Mudania-Brussa, 25 miles; Smyrna-Cassabra, 165 miles; Alasheir-Afion-Karahissar, 156 miles; Smyrna-Aidin, 320 miles; Konia-Eregli-Persian Gulf, 125 miles; Messina-Adana, 42 miles; Beirût-Damascus-Mzerib, 153 miles; Rayak-Aleppo, 204 miles; Tripoli-Homs, 63 miles; Damascus-Medina, 812 miles; Jaffa-Jerusalem, 54 miles; Haifa-Deraa, 105 miles; making a total of miles open for Asia of 2,865. Territorial changes after the Great War have caused the loss of much of this mileage to Turkey. The Bagdad Railway concession to Germany had for object the extension of the Anatolian line from Konia to Adana, Mosul, Bagdad and Basra, with numerous branches. It has been constructed continuously as far as Kara Bunar in Cilicia. The following sections have also been completed: Dorak to Bagtché on the Adana side of the Taurus Mountains; Radjun via Muslimié to Jerablus on the Euphrates, with branch from Muslimié to Aleppo; Jerablus to El-Abiad in the direction of Nisibin (with a wooden bridge over the Euphrates); Bagdad to Samara; Alexandretta to Toprak Kalé on the Dorak-Bagtché line. The line from Konia to Bagdad will have a total *length of* 1,509 miles, of which 1,117 miles (not continuous) are now in operation. In 1916 Turkey,

A
B
C
D
E
F
28°
32°
36°
42°
34°
30°
1
5
6
7
BLACK SEA
EUROPE
CONSTANTINOPLE
Bosporus
Kirk-Kilise
Silivri
Rodosto
Kerpe
Isnid
SKUTARI
Kandra
Cherdek
Adalassa
Yalova
Gemlik
Gulf of Saros
Gallipoli
Dardanelles
SEA OF MARMORA
Inje Liman
Bighe
Artaki
Bandurma
Madania
Isnik L.
Lemni I.
Castran
Imbros I.
Troy Ruins
TENEDOS I.
Hagiostratis I.
C. Baba-burun
Gulf of Adramyti
Kale-i-Sultaniye
BIGHA
Brusa
Abullonia
Bilejik
Sakaria R.
Adranos
Sogud
Dumanitch
Assarlik
Boghadich
BRUSA
Eskishehr
Sidi Gasi
Sivri-hissar
Pessinonte
Angora R.
ANGORA
Kadiköi
Karaketchela
Denek-maden
Yozgad
Kutaia
Simav
Gediz
Gediz R.
Asisieh
Kirshehr
Boghazlayan
Kizil Irmak River
Delije-Irmak
Sivas
Yenikhan
Ulasch
Scharkyschla
Gemerek
Mazaka
Sarymsakly
Kaisarieh
Goran
Derendah
Yarpuz
Göksün
Zeitun
Marash
Bazche
Osmanje
Yarpuz
Payas
Alexandretta
Gulf of Alexandretta
Lake Kadez
Antioch
Jilib
Riha
Ma'arrat
Kalaat el-Medik
Latakia
Ras el-Basit
Banias
Hamidije
Hamah
Selemije
Homs
Tartus
Tarabulus
Kalat el Hosn
Ghasr
Djunehe
St. George Bay
Beirut
Dier el Kamar
Saida
Surafend
Es Sur
Damascus
Rascheja
Hasbeya
Acre
Safed
Sea of Galilee
Mezeirib
Nemara
Haifa
Atlit
Tubariya
Caretti
Tantûra
Tibneh
Bozra eski-Shâm
Cæsarea Ruins (Kalsarieh)
Nabulus
Jaffa
Es Salt
Ramieh
Eriha
Amman
Esdûd
Jerusalem
Askalan Ruins
Ghuzzeh (Gaza)
Bethlehem
Hebron
Ain Jidy
Dhiban
Kerak
Ratrane
El Hasa
JERUSALEM
Schobek
Petra Ruins
Gulf of Akaba
Burlus Lake
Rosetta
Edku Lake
Damietta
Menzaleh Lake
Alexandria
Mariut Lake
Port Said
Damanhur
Mehallet el Kubir
Mansura
Tanta
Shibin-el-Kum
Zagazig
Ismailia
Bitter Lake
EGYPT
Gizeh
CAIRO
Helwan
Suez
GULF OF SUEZ
LIBYAN DESERT
Nile R.
Ægean Sea
Mitylene I.
Psara I.
Khio I.
Nikaria I.
Patmos I.
Amorgos I.
Astypalaea I.
Nisiro I.
Scmbeoi I.
Rhodes (Kastro)
RHODES I.
Lindos
C. Prasonisi
Kerpe I.
Kashut I.
Sporades
Smyrna
SMYRNA
Menemen
Sulihli
Kula
Alashehr
Ine-göl
Tschivril
Sandykly
Ushak
Khun Kara Hissar
Manissa
Akhissar
Eski-Fodga
Kirk-Agach
Soma
Mitylini
Pergama
Menderes R.
Gir-oba
Denizli
Bozdogan
Yerangome
Mendelia
Milas
Mugla
Ughla
Budrum
Gulf of Kos
Marmaris
Istanoz
Dirmil
Kestel
Basch-koi
Adalia
Elmaly
Makri
Kaja
Gulf of Makri
Kemer
Kassaba
GULF OF ADALIA
C. Khelidonia
Egerdir
Egerdir Göl
Izbarta
Burdur
Burdur Göl
Korkuteli
Beishehr
Beishehr Göl
Seidi Schehr
Soghlah Göl
Konieh
Ismil
Kara Punar
Karamania
Karamanian Mountains
Taurus
Bulgar Dagh
Balkis
Bazardjik
Alaja
Mersina
Tarsus
Ermenek
Selefke
Selinti
Chorak
C. Karatash-burun
C. Cavaliere
Schelindere
C. Anamur
C. St. Andreas
Akanthou
Kyrenia
Lapithos
C. Kormakiti
Rizokarpaso
Leukoniko
Salamis Ruins
Famagusta
C. Greco
Larnaca
Limasol
C. Gata
Nikosia
Lefka
Kouklia
Episkopi
CYPRUS (BRIT.)
C. Arnauti
Ayash
Ayas
Adana
Sihun R.
Jarsuglan
Sis
Hadjin
Anti-Taurus
Erjias Dagh
Akserai
Melegob
Ortaköi
Nevshehr
Urgub
Injesu
Tuz Göl
Salt Desert
Akshehr
Lake Akshehr
Egerdir
Kirili
Tschivril
Dinar
Ushak
Khun Kara Hissar
Sandykly
Tschorum
Sungurlü
Aladja
Boghaz-köi
Angora
Kalejik
Kizil Irmak River
Yozgad
Janglon
Yenikhan
Sivas
Tokat
Zile
Amasia
Turchal
Gümenek
Haddjikoi
Aladjik
Yeshil Irmak R.
Tschorum
Kanghri
Iskilib
Osmanjik
Mersivan
Kaban
Ak Göz
Melitsch
Samsun
Bafra
Durachan
Boyabad
Kastamuni
Devrikjan
Tachkoi
Gök River
Bartin
Tscharschamba (Teha-Djuma)
Zafaranboli
Lossa
Ezir Köprü
Tschanga
Ilgaz
Ala-dagh
Tschaschamba
Nallihan
Beibazar
Torbalu
Tara Kln
Mudurlu
Geiveh
Mudania
Isnik L.
Gemlik
Yalova
Kandra
Cherdek
Isnid
Adalassa
Kerpe
C. Baba
Eregli
Songuldak
Kosln
Filios
Kilimli
Atnakera
C. Kerembe
Inebolli
C. Indje Burun
Sinope
Matscham
Ak Göz
Melitsch
Samsun
Ibrahimsch
Iris R.
Yeshil Irmak R.


TURKEY IN ASIA
SCALE
Statute Miles. 10 8 = 1 Inch.
0 5 10 20 30 40 50 60 70 80 90 100 120 140 160 180 200
Rand, McNally & Co's New 11 x 14 Map of Turkey in Asia.
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RUSSIA IN ASIA
CAUCASUS MTS.
CASPIAN SEA
PERSIA
ARABIA
ARMENIA
KURDISTAN
MESOPOTAMIA
Kutais
Poti
Batum
Tiflis
Derbent
Trebizond
Erzerum
Kars
Alexandropol (Gumry)
Elisabethpol
Nukha
Baku
Erivan
MT. ARARAT 16,925
Lake Gokcha
Kura (Kur) River
Aras River
Lake Van
Van
Bitlis
Mush
Khoi
Tabriz
Lake Urumia
Urumia
Julamerk
Diza
Shirvan
Astara
Elburz Mts.
Uzen River
Mosul
Erbil (Arbil)
Kerkuk
Suleimania
Altyn-Kopru
Daduk-Tauk
Tuz Churmati
Kefri
Kermanshahan
Khanikin
Hamadan
Deli Abbas
Samara
Tekrit
Euphrates
Tigris
Bagdad
Sorbatje
Seleucia Ruins
Babylon
Kerbela
Hille
Kut el Amarah
Ali-Gharbi
Kut el-Hai
Amara
Abu Muhammed
Hauwisa
Hydyr
Korna
Dizful
Kerkha River
Karun R.
Divanieh
Lamlun
Nejef
Kiran
El Chidr
Samava
Arka
Suk-esh-Sheiyuk
Medina
Shat-el-Arab
Muhammera
Busra
Zobeir
Bubiane
Persian Gulf
Aleppo
Birejik
Urfa
Harran
Rakka
Sura
Resafe
Halebi Ruins
Deir
Meyadin
Kerkesia Ruins
Kidjim il Cheli
Tadmor (Palmyra Ruins)
Albukemal
Djerije
Ana
Djuanije
Uss
Baghdadije
Hit
Ramadi
Musejjib
Nineveh
Telkef
Roanduz
Sidek
Zakho
Amadia
Mardin
Midyad
Jezire-Ibn-Omar
Nisibin
Diarbekir
Mamuret-el-Aziz
Harput
Palu
Chemuk
Redwan
Sort
Hasan Kef
Mafarkio
Hazro
Maden
Arghana
Hini
Nerschiki
Tadwan
Archag
Djanik
Akanis
Melazkert
Palnatz
Konus
Hassan-Kala
Toprak-Kale
Karakilisa
Hidja
Ispir
Bosdjkent
Harbuit
Kelkit
Gumushkhane
Kara-Hissar
Trebizond
Chopa
Batum
Atina
Rize
Elehu
Surmene
Pertegrek
Balkar-dagh
Kerason
Tireboli
Gerdjanis
Kemakh
Egin
Khozat
Mascin
Pertek
Chewelik
Mezre-el-Aziz (Mezere)
Malatia
Arabkir
Eban-Maden
Adiaman
Fik
Seserek
Narseid
Birejik
Kalat el Nejim
Euphrates
Eastern
Khabur
River
Zab River
Little Zab River
Tigris
Kerkha River
Karun R.
Shat-el-Arab
Persian Gulf
Uzen River
Aras River
Kura (Kur) River
Euphrates or Kara Su
Chorokh
Kizilirmak R.
Yeshil Irmak R.
Gumushkhane
Kara-Hissar
Kelkit
Gerdjanis
Egin
Khozat
Arabkir
Eban-Maden
Malatia
Mezre-el-Aziz
Adiaman
Seserek
Narseid
Birejik
Kalat el Nejim
Harran
Urfa
Rakka
Sura
Resafe
Halebi Ruins
Deir
Meyadin
Kerkesia Ruins
Kidjim il Cheli
Tadmor (Palmyra Ruins)
Albukemal
Djerije
Ana
Djuanije
Uss
Baghdadije
Hit
Ramadi
Musejjib
Nineveh
Telkef
Roanduz
Sidek
Zakho
Amadia
Mardin
Midyad
Jezire-Ibn-Omar
Nisibin
Diarbekir
Mamuret-el-Aziz
Harput
Palu
Chemuk
Redwan
Sort
Hasan Kef
Mafarkio
Hazro
Maden
Arghana
Hini
Nerschiki
Tadwan
Archag
Djanik
Akanis
Melazkert
Palnatz
Konus
Hassan-Kala
Toprak-Kale
Karakilisa
Hidja
Ispir
Bosdjkent
Harbuit
Kelkit
Gumushkhane
Kara-Hissar
Trebizond
Chopa
Batum
Atina
Rize
Elehu
Surmene
Pertegrek
Balkar-dagh
Kerason
Tireboli
Gerdjanis
Kemakh
Egin
Khozat
Mascin
Pertek
Chewelik
Mezre-el-Aziz (Mezere)
Malatia
Arabkir
Eban-Maden
Adiaman
Fik

as it then was, had 3,720 miles. Before the Great War the Turkish government controlled 1,116 miles. The British military authorities took over the administration of the Bagdad Railway in January 1919. There are 1,814 post offices in the empire, which handle an average of about 22,000,000 letters, 2,000,000 post cards and 14,000,000 samples and printed matter annually. A parcel post system has been introduced. Foreign post offices were abolished in Turkey on 1 Oct. 1914. There are 28,890 miles of telegraph lines with about 50,000 miles of wire and about 11,000 telegraph offices. The volume of business approximates 6,000,000 messages annually.

Commerce.— Commerce as well as agriculture seems to be greatly retarded and its development prevented by the duties on imports and exports and the taxes imposed on the trade between different divisions of the empire. All articles imported into Turkey are taxed 8 per cent ad valorem, except tobacco and salt, which are monopolies. There is an export duty on all produce sent abroad, except cereals, and all produce sent from one division of the country to another pays the 8 per cent. The total trade of Turkey in 1913–14 was $183,048,400 for imports and $97,180,600 for exports. In 1916–17 the imports declined to $98,526,520 and the exports to $58,292,905. The imports in 1913–14 came from the United Kingdom, 20 per cent; Austria-Hungary, 15 per cent; France, 7.7 per cent; Germany, 12 per cent; Russia, 7.5 per cent; Rumania, 10 per cent; Italy, 11 per cent; Egypt, 4 per cent and the United States 2.6 per cent. Greece, Bulgaria and The Netherlands supplied the remainder. The exports were taken by Great Britain, 20 per cent; France, 18 per cent; Austria-Hungary, 11 per cent; and Egypt, the United States and Germany about 4.5 per cent each. In 1916–17 almost 80 per cent of both import and export trade was with Germany and Austria-Hungaria.

Shipping and Navigation.— The shipping and navigation facilities of the Turkish Empire consisted in 1911 of 120 steamers with a total carrying capacity of 66,878 tons; sailing vessels, 963, with a tonnage of 205,641.

Army.—At the beginning of 1914 the new military service law was put into effect by the War Minister, Enver Pasha. Under the terms of this law it was ordained for the first time that every male Ottoman subject was liable to military service and that even where an exoneration tax would be accepted, this did not exempt the individual from military training, but only from a portion of the full term. When the army was mobilized later in the year, the provisions of the law were rigorously enforced, in so far that all males of military age, whether Moslem or Christian, were called into the service. Inasmuch as there were numerous exemptions under previous laws, under which Christians were almost wholly exonerated from service, a very great number of untrained men were called to the colors. These were divided into three classes: (1) Moslem, who were at once placed in training; (2) Christian, few of whom were placed in combatant service, but who were largely employed in transport and auxiliary service, and (3) certain persons, both Moslem and Christian, who were allowed to pay a high exemption tax. This tax was used to defray expenses of mobilization, etc. In February 1917 a law was passed providing for universal military service between the ages of 20 and 45. The term of actual service was placed at two years in the infantry and three in other branches, the remaining years up to 40 being spent in the *Ihtiat*, or reserve. From 40 to 45 the service is continued in the *Mustahfiz*, or territorial army. The tribal, or irregular Kurdish, cavalry was employed in military operations during the Great War. Turkish divisions have normally three line regiments and six to nine field or mountain batteries, each line regiment consisting of three battalions; thus the division comprises nine battalions. The artillery, where armed with quick-firing guns, is organized in four-gun batteries and where armed with older guns, in six-gun batteries. An army corps consists of two or three divisions, a cavalry brigade, three howitzer batteries, engineer battalion, transport battalion and signal company. The peace strength of the army is estimated at about 200,000 men; the war strength is approximately 1,000,000.

In addition to the regular military forces mentioned above there are large forces of gendarmerie, necessitated by the many subject races and turbulent elements within the empire. This force amounts to about 60,000 men, of whom about 16,000 are mounted. It is distributed throughout the empire and during the Great War the bulk of this force performed army duties, being replaced by territorial forces. The Turkish infantry is armed with the 7.65 millimeter Mauser magazine rifle, model of 1890. The artillery possesses about 110 quick fire field and horse batteries of 7.5 centimeter Krupp batteries. The mountain artillery has 22 batteries of the same size Krupps and 27 Schneider quick-fire batteries.

After 1909 the Turkish army was reorganized under direction of a German military mission, whose head was Field Marshal von der Goltz. The mission consisted of about 20 officers. Four years later the scheme was amplified and the mission expanded to 40 officers. Marshal Fiman von Sanders and his suite took charge in January 1914. For the history of the Turkish campaigns see WAR, EUROPEAN.

Navy.— The only ships of real value as naval vessels are the *Torgut Reïs* of 9,876 tons and armed with six 11-inch guns, fitted with engines developing 10,000 horse power and capable of steaming 16 knots; the *Sultan Selim*, battle cruiser, formerly the German *Goeben* (see GOEBEN AND BRESLAU) of 22,640 tons, armed with 10 11-inch guns and 12 six-inch guns, and four torpedo tubes, engines of 70,000 horse power and having a speed of 27 knots; the cruiser *Hamidieh* of 3,800 tons, armed with two six-inch and eight 4.7-inch guns, engines of 12,500 horse power and with a speed of 22 knots. In addition there are about 20 gunboats and vessels, one-half of them being modern, nine destroyers and six torpedo boats, with some transports and a considerable number of auxiliary vessels and motor boats. A submarine flotilla was brought into being during the Great War. Under the terms of the armistice concluded 30 Oct. 1918 all Turkish ships and vessels of war were surrendered on 5 November to the Entente powers. The vessels lay at the Golden Horn, except the *Sultan Selim* (ex-*Goeben*), which was at Stenia, in the Bosporus.

Religion.— Mohammedanism is the officially established and recognized religion, but other forms of worship are tolerated. Among these non-Mohammedan native communities or "Millets" which are recognized by the Turkish government are Latins or Catholics, Orthodox Greeks, Armenians, Armenian Catholics, Chaldean Catholics, Protestants, Nestorians, Syrian Catholics, Syrian Jacobites, Melchites, Jews, Bulgarian Catholics and Maronites. All these may possess their own ecclesiastical rule and their spiritual heads have a high place in the civil community. The sultan as caliph is supreme head of the Moslems. The chief ecclesiastical dignitary is the Sheikh-ul-Islam, but his functions are judicial and legal rather than spiritual. He is a member of the Cabinet.

There is no priesthood in Mohammedan Turkey in the strict sense of the term. The Ulema, however, or persons connected in one way or another with the official ministrations of Islam, form a separate class. The principal charges in connection with mosques, theological schools, etc., are to a large extent hereditary. The number of mosques in the empire as it was in 1914 is computed at 2,120, of which 379 were in Constantinople and many others in territory now torn from the empire. The number of the clergy was 11,600. Connected with the mosques are 1,780 elementary schools, where education is supplied gratis. The temporalities of the Church are controlled by the Ministry of Pious Foundations (*Evkaf*), which has a separate budget of its own. The revenue of the Evkaf is derived chiefly from charges on and reversionary interests in real property which has at one time or another been made the subject of consecration to religious purposes, and which is known as Vakuf. The department of the Sheikh-ul-Islam is not provided for in the budget, but in that of the state. Moslems form 92 per cent of the whole population; Christians about 7 per cent and Jews the remainder.

Education.— Elementary education is nominally obligatory for all children of both sexes. A law of 6 Oct. 1913 provided that children from 7 to 16 should receive primary instruction either in state schools, schools maintained by religious communities, private schools or, subject to certain tests, at home. State schools are under the direct control of the Minister of Public Instruction. Community schools also are inspected by the Ministry. There are several religious foundations which maintain theological seminaries. There are also intermediate or secondary schools for boys from 11 to 16 years of age, and similar institutions for girls were inaugurated in 1918–19. Five such schools for girls in Constantinople have 2,000 pupils. Aleppo has 710 Moslem, 250 Christian, and 30 Jewish, with 19,000, 8,000 and 2,000 pupils respectively. In all 36,230 schools were enumerated in 1918 with 1,331,200 pupils. There are training schools for teachers but the standard is low. French, English, German and American missionaries maintain sectarian schools. A university was founded at Constantinople in 1900. It was reorganized in 1918. There are five faculties, arts, theology, law, medicine and science. The faculty of medicine and the Military Medical School occupy a modern building at Scutari. Other schools of higher learning are the Imperial Art School, the Greek Great National School, with 400 students, and the Greek Theological Seminary with an average of 80 students.

Archæology.— The modern explorers, excavators and decipherers, or translators, have given us a new world, a large portion of which is below the surface of the territory occupied by the Ottoman Empire, chiefly in Babylon, Asia Minor, Palestine, Egypt, Assyria and Arabia. The land of Babylon and Nineveh, of Assyria and Khorsabad would naturally be fruitful in records of the past. The number of cuneiform documents found in Macedonia alone are of great value. One of the causes which have contributed to the recent activity in searching for archæological remains is the desire to secure corroborative testimony in favor of the Bible. Such reasons greatly influenced some of the American missionary societies to begin investigations. The University of Pennsylvania sent out an expedition which discovered, in the vicinity of Nuffar, 2,000 cuneiform tablets, many of which were in existence 2,800 years before the birth of Christ. Dr. Hilprecht was appointed to supervise the editing and classifying of the results of the expedition. The collection contains many inscribed bricks, clay stamps for bricks, marble vases, sacrificial vessels, door sockets, enameled and plain vases, seals and seal cylinders, gold and silver ornaments, clay sarcophagi, stone, iron and bronze articles, bas-reliefs, intaglios, human skulls and numerous other articles. The American Archæological Institute explored the territory near Asso (present Behram) in the years 1881-82. The excavations brought to light buried fortifications of successive periods, baths, theatres, temples which were of the archaic Doric order and down to and within the Christian era, porticos, private dwellings, a gymnasium, a Greek bridge and a highly ornamented group of tombs. Other exploring expeditions have been sent to Turkey by the French, English and Germans, and the Turkish government has given the matter considerable attention. In an article on the Turkish excavations by Americans, written by James B. Fox, he says: "The dreary solitudes that long brooded over those buried civilizations have begun to disappear before the labors of dauntless and indefatigable explorers, and a literature, almost overwhelming in extent, graven in clay and stone, transports us back to the very cradle of the race. They reveal a perfection of art, a marvelousness of correspondence, a development of civilization in those primeval days that excite the wonder and admiration of our more enlightened age. Schools and libraries must have existed everywhere; clay books were stored in the cities; letters of every description were exchanged on every subject; and, judging from the tablets of Zel-el-Amarna, Canaan was a centre of correspondence, even before the age of the Exodus. The objection of the 'higher critics' that Moses could not have written the Pentateuch, because the art of writing was unknown in his day, falls hopelessly to the ground."

The whole country, especially Syria, Palestine and Babylon, contains vast archæological treasures. Specimens of Byzantine architecture still exist in a good state of preservation. The statues found among the ruins of ancient Nineveh, and preserved in the British Museum, are remarkable monuments. The half-tamed

Turk had wandered for centuries over the plains near the Tigris without ever dreaming that he was crossing the place of sepulchre of a once gorgeous city, until Sir Henry Layard (q.v.) and other English explorers began the excavations which restored Nineveh to the world.

The Turkish government has, since 1884, opposed the removal of objects of antiquity from the country, and no excavations may be made without a firman. The government has a valuable collection of archæological specimens at the museum of Tchinli Kiosk. The splendid archaic frieze of the Doric temple in Assos is not in one place, but portions are in America, Paris and Constantinople. Facsimiles of some of the famous statuary found in Nineveh (originals in England) are in museums in New York and other places. See ASSYRIA; ASSYRIOLOGY; BABYLON; CANAAN; BIBLICAL ARCHÆOLOGY; NINEVEH; PALESTINE; TEL-EL-AMARNA, etc.

Finance.— The public revenue of Turkey comes from the following sources: direct taxation, tithes, verghis (land and property tax), temettu (income tax), for exemptions from military service, aghnams (tax on sheep, cattle, etc.), and other sources; indirect taxation, various customs (salt, tobacco, spirits, stamps, fisheries, silk and other sources), administrative and military departments, share in tobacco Régie profits, tribute revenues and other sources. The largest portions of the expenditure are for debt charges and for military purposes. No regular budget existed before the restoration of the Constitution in 1908. Since that year there have been voted or enacted by the executive a budget and finances for every year. The revenue in 1918–19 was £T33,965,698 ($152,845,641) and the expenditure £T51,762,761 ($232,932,424). The chief items of expenditure were: finances, $46,778,040; post office, $5,350,-414; police, $11,541,406; justice, $4,806,634; education, $4,826,416; commerce, $7,123,059; army, $27,198,454; navy, $7,668,256. For the civil and religious administrations 21 per cent of the general expenditures is allotted, while ordinarily 28 per cent is reserved for the military establishment. Unable to meet its liabilities the Ottoman government made an arrangement with its creditors, confirmed by the *Iradé*, of 8/20 Dec. 1881, supplemented and modified by the *Iradé* of 1 Sept. 1903. A council of administration was appointed, to which were handed over for distribution among the bondholders the funds derived from the excise duties and other funds. On 31 Aug. 1918 the total debt was placed at £T454,649,590 ($2,045,923,155) of which £T149,475,754 ($677,-640,893) is external debt.

Money.—A charter for a new national bank, to be known as the Ottoman National Credit Bank (*Osmanli Itibar milli Bancassi*) was issued by the government in January 1917. Its capital is $18,000,000 (£T4,000,000). With the expiration of the privileges of the Imperial Ottoman Bank in 1925, the new bank becomes the state bank with the right to note issue. The Imperial Ottoman Bank in 1910 had a capital of $45,000,000, a note circulation of £T941,250 ($4,235,625) and cash on hand to the amount of £T3,568,834 ($16,140,753). The note issue of this bank consisted up to 1914 of notes of £T5 and upward ($22.50), secured by a gold reserve of not less than 33 per cent of the face of the issue. During the War 1914–18 there were five emissions of paper currency secured by German treasury bills. The total of these was about $383,000,000. Currency reform was inaugurated on 17 April 1916. A gold standard with the piastre as the unit is to be general all over Turkey. The piastre equals 40 para. Piastre, half-piastre, quarter-piastre and eight-piastre pieces are of nickel. Two, 5, 10 and 20-piastre pieces are of silver, 25, 50, 100, 250 and 500 piastre pieces are of gold. The gold 100-piastre piece weighs 7.216 grammes, .916 fine, or has 6.6147 grammes of pure gold. It is equal to £T1 or $4.50 in currency of the United States.

Weights and Measures.— The *Oke* of 400 drams is equivalent to 2.8326 pounds avoirdupois; the *kileh* = 0.9120 imperial bushel; 44 *Okes* = 1 Kintal or 125 pounds; 39.44 *Okes* = 112 lbs.; 180 *Okes* = 1 *cheke* or 511.380 pounds; *Endazé* (cloth measure) = 27 inches; one *arshin* (land measure) = 30 inches; one *donum* (land measure) = 1,098.765 square yards. Since 1889 the metric system is obligatory for cereals; metric weights were decreed obligatory in 1892, but the decree does not appear to have been enforced. On 1 March 1917 Turkey introduced the Gregorian calendar and it is now used side by side with the Mohammedan or Hegira calendar.

Government.— The government of Turkey is an absolute monarchy and the sultan is the ruler. The succession to the throne is hereditary. It is now and since 1617 has been vested in the family of Othman (or Osman), in the person of its oldest living male member. The sultan is, therefore, succeeded by his oldest son, provided there are no living uncles nor cousins who are older in the Othman family. The oldest son takes the throne without regard to his mother, provided he sprang from the harem. The harem is a permanent institution of the empire, and all children born in the harem, no matter who their mothers are, whether free women or slaves, are legitimate and of equal lineage. It has been the rule and custom of the sultans of Turkey for many centuries not to contract regular marriages, but to maintain the harem. The inmates of the harem are women who are brought to it by purchase or who come to it by their free will. The greater part of them have heretofore come from places outside of the empire, the majority having come from Circassia. The sultan selects a certain number, generally seven, to be "Ladies of the Palace," who are called "Kadyn." The rest are called "Odalik," as they remain under the "Kadyn" as servants. There is a superintendent of the harem, an aged woman of the palace, who bears the title of "Haznadar-Kadyn."

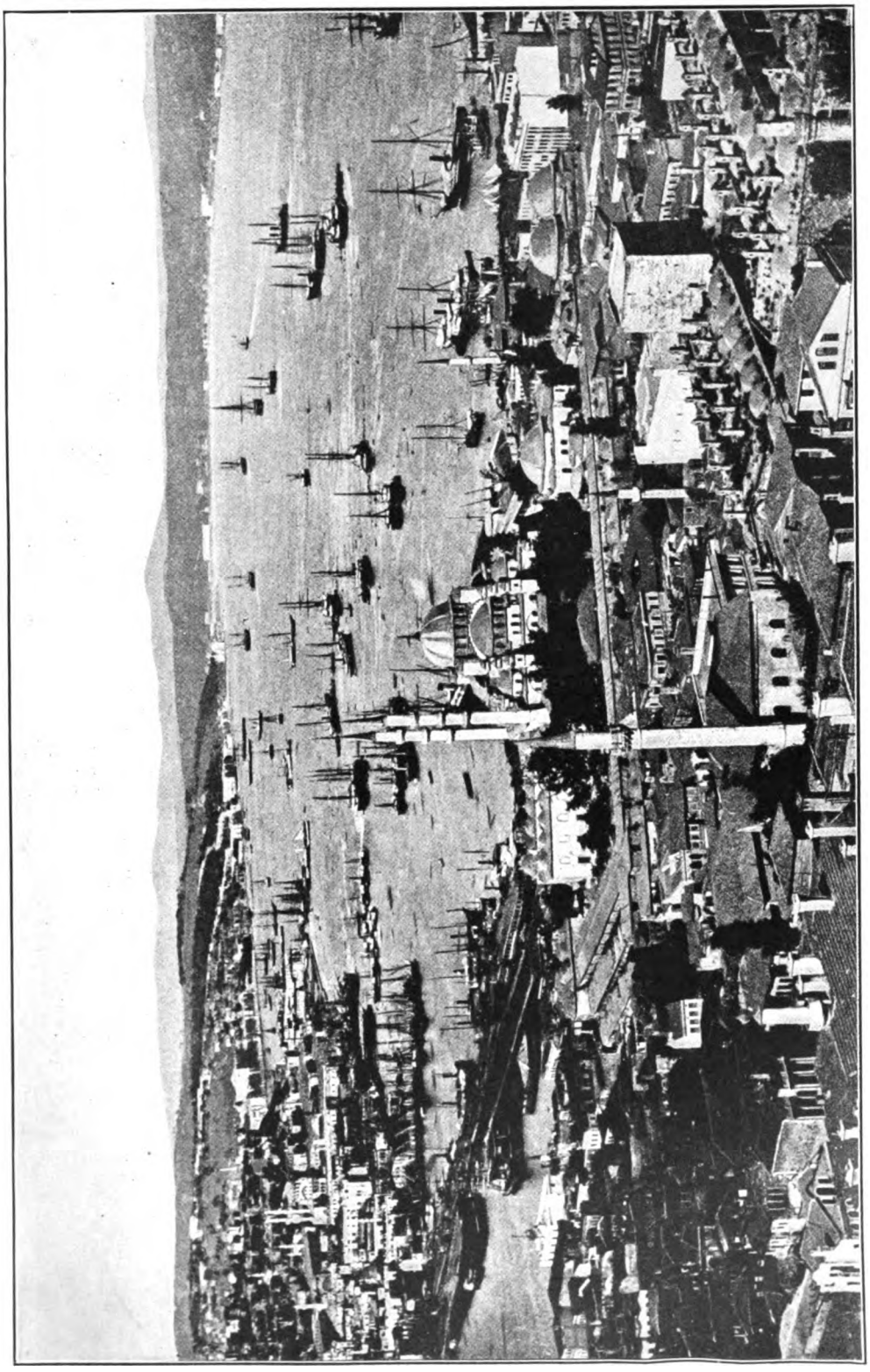
Constitutions after the model of West European states were drawn up at various periods by successive Ottoman governments, the first by Sultan Abdul Medjid was proclaimed 3 Nov. 1839, and the most recent in a decree of Abdul-Hamid II in November 1876. The latter provided for the security of personal liberty and property; for an irremovable judiciary; torture was abolished; the freedom of the press conceded, and equality before the law of all Otto-

man subjects was proclaimed. Islam was declared to be the state religion, but freedom of worship was secured to all creeds, and all persons, irrespective of their creed, were declared eligible to public office. Under this constitution the legislature should consist of two houses, a Chamber of Deputies and a Senate. Senators were to be appointed by the sultan, from among those who had deserved well of the state and should be at least 40 years of age. Every 600 electors were to select one electoral delegate and the latter were to choose one deputy for every 6,000 electors. Electors must be Ottoman citizens of at least 25 years of age and electoral delegates must be at least 30 years of age. In 1878 this constitution became a dead letter and the reign of Abdul-Hamid II was a more complete autocracy than perhaps any of his predecessors. In 1908 the prevailing discontent, which also developed in the army, caused by decades of corruption and misgovernment, compelled the sultan to issue a decree for the convocation of a new Parliament, and on 23 July 1908 constitutional government was restored in Turkey. The constitution in force is theoretically that of 1876, but it has been modified in some respects since 1908. For administrative purposes the empire is divided into vilayets, or governments, these subdivided into sanjaks, or minor provinces, these into smaller divisions known as kazas. At the head of each vilayet is a governor-general, or vali, representing the sultan, and assisted by a provincial council. Over the minor divisions are local authorities (mutesarrifs, kaimmakams, mudirs, etc.), subject to the governor-general. Political reasons since 1908 have led to frequent modification of the vilayet system. Thus several of the sanjaks are governed directly by mutesarrifs reporting direct to the Minister of the Interior. These are known as independent sanjaks and are in every case detached from the vilayet to which they hitherto belonged.

In 1913 a new law on vilayets was promulgated. Its ostensible purpose is to decentralize authority and a bill of 1918 provided for the creation of three new sanjaks in Mesopotamia, to be set up in March 1919. In 1919 Mesopotamia was being administered by the British.

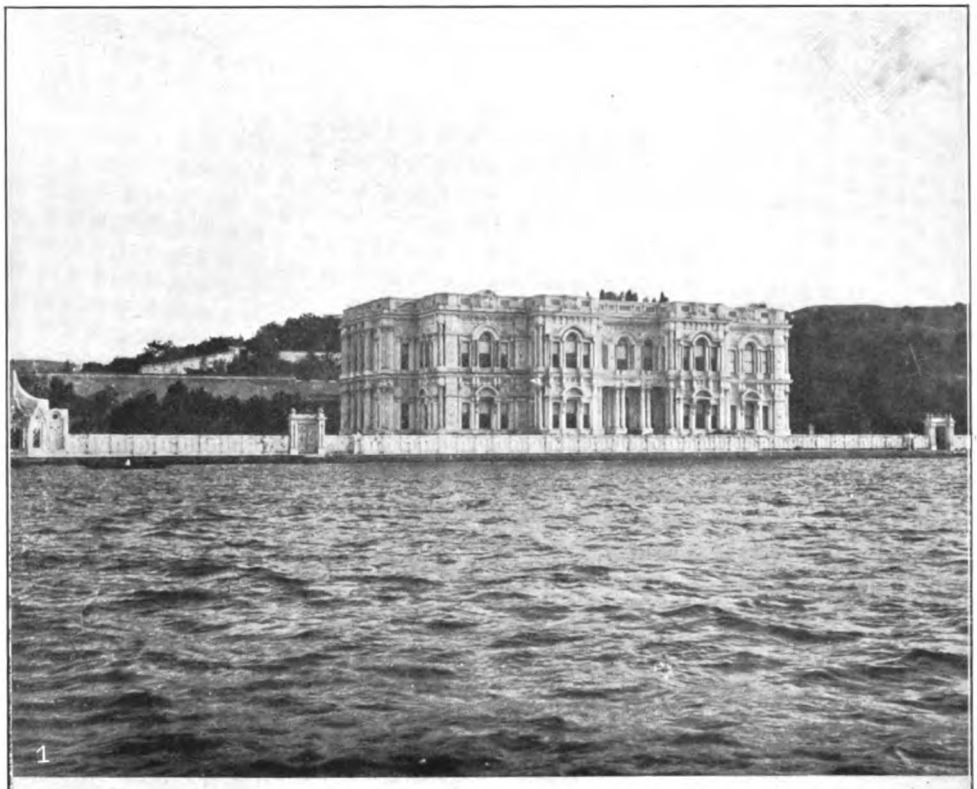
History.— The origin of the Turks, like that of the Arabs and almost all the Eastern nations, is enveloped in darkness. It has been sought in the Tatars of the Caucasus and among the ancient Parthians (the conquerors of Persia); some ethnographers claim the Turks as descendants of the Scythians, or roving Tatars, who possessed the country between Sarmatia and the Tanais, and who, after overrunning all Asia, conquered Turkestan, from which they received the appellation of Turks. The Ottoman people at the present day call themselves Osmanlis, from a Turkish chieftain named Osman (or Othman), who established himself at Brussa in the 14th century. In the Turkish language the word "Turk" means a rustic or clown, and the Turks consequently never apply that word to themselves, but reserve it for the Turcomans and other tribes of central Asia.

The language of the Turks shows they are near of kin to those who spoke the Ural-Altaic or Turanian languages, which were in use from the western frontier of China to the Caspian Sea. There are different dialects, the harsh one of the east and the soft and more melodious one of the west, but many of the words, phrases and grammatical forms are similar. A portion at least of the present Turkish race are descendants of a people who once inhabited the territory west of Lake Baikal. The claim is made that while living near the shores of that lake Christian missionaries visited them, and in support of this claim is the fact that their ancient alphabet had 14 letters based on the Syriac alphabet. The name "Turks" given to the mighty hordes who dwelt on the steppes of northern Asia, at the foot of the Altai Mountains, and beyond Persia, is first mentioned in our history about the middle of the 6th century. They were an aggressive people, seeking existence in lands where others had found sustenance. At the present day the name of Turk or Tatar generally denotes a Moslem speaking a Turkish language, and Mongol a Buddhist speaking a Mongol language. But in earlier centuries it is not so easy to draw that distinction. Timur (Tamerlane) has been described both as a Turk and a Mongol; he came of a Turkish-speaking stock, and his descendants founded the "Mogul" Empire in India, a name which appears to be a variant of "Mongol." The only certain distinction between the Turks and their kindred tribes is linguistic, but in nearly all cases the Turkish-speaking stocks have shown themselves warlike and mobile to a remarkable degree, and where these qualities are found among non-Turkish-speaking tribes — as among the forbears of the Magyars — an admixture of Turkish blood may be suspected. It has always been a puzzle to historians how a race of people which had never before been politically conspicuous in the world should suddenly have exhibited such a marvelous power of conquest. Nor could one have expected the rise of a race of world conquerors from the multitude of barbarians who were ever roving to and fro in the vast sandy desert of Arabia, where they preyed upon one another, marking history with but few traces of their existence. But the Turks, starting as an obscure tribe from the confines of China, have touched Vienna, Algiers, Arabia, Egypt and India; while the Arabs under Mohammed and his successors not only produced and spread a new religion, but extended in less than a century throughout Arabia, Syria and Egypt, along the coast of Mauretania far into the interior of Africa, and included within their embrace Spain and part of Gaul. Eastward, Persia and Scinde had been subdued and Transoxiana invaded by the Arabs. Translations made in recent years from Chinese histories reveal the existence, over 1,000 years B.C., of warlike nomads called Hiung-nu (Huns), a generic title applied to various barbarous tribes whose original haunts were the plains of central Asia, from the Oxus to the Arctic Circle and from the borders of China to the Caspian Sea. They lived on horseback and were trained to handle bows and arrows from childhood. From these records we can trace the Turks as a branch of the Hiung-nu as far back as the middle of the 5th century of our era. One of the clans — the Asena — settled near the modern town of Shan-tan, in the province of Kan-su. In their vicinity was a hill called from its shape Dürkö, or Tü-chüch, the



Constantinople and the Bosporus

TURKEY



1 The Palace of a Turkish Governor-General

2 Boating on one of the Rivers of Turkey

«helmet.» This is said to have been the origin of the name which has since been so widely applied and become so famous in history. About the middle of the 6th century we find the Chinese calling these people the «Tu-kiue» and attributing to them an astonishing degree of progress. Within a few years they became a world power which had relations with China and Byzantium. In about the year 800 they secured possession of a part of the territory now called Armenia, and they named the place Turkomania. They were that branch of the Turk family which learned the Mohammedan religion from the Saracens and, later, founded the Ottoman dominion in Europe. Turks and Saracens first came together early in the 8th century, when the caliph, or successor of the Prophet, ruled as temporal and spiritual chief over the Mohammedan world. As soon as the Saracens began to conquer and convert the Turks, the latter began to play an important part in history. Under the caliphs they appear as slaves, as subjects, as mercenaries, as practical masters, as avowed sovereigns and, finally, claiming for themselves the powers of the caliphate. In process of time the chiefs of this barbarous soldiery arrogated to themselves the most important offices in the state, leaving to their sovereign only a nominal authority. Harassed by civil disorder and sectarian violence, the caliphs were unable to check the usurpations of those who, in their names, ruled the provinces of the empire, and whose ambition it was to become the founders of separate and independent dynasties. Thus one province after another was lost, and in the end Baghdad fell into the hands of the Mogul Hologu. From the 11th to the 13th centuries the Turkish dynasty of the Seljuks (q.v.) ruled over a large part of Asia. Later this empire was divided on account of internal dissensions, and during the 13th century the Mongols became virtually the owners. It was in the course of the struggles between Seljuks and Mongols that the name Ottoman Turks first appeared. Othman was the son of Ortogrul and grandson of a Turkish emir who, early in the 13th century, and on the approach of the Mogul Ghengiz Khan, left his home in Khorassan in search of some safer settlement in Asia Minor. On the march he perished in the Euphrates, but Ortogrul obtained from the Seljuk sultan of Iconium settlements for his followers in the ancient province of Phrygia. His son, Othman, extended his possessions chiefly at the expense of the Greek emperor, and in 1299, on the death of his patron, the ruler of Iconium, assumed the title of sultan. Thus began the Ottoman Empire; a succession of 10 great princes of the dynasty widely extended their territories and raised their military power to the first rank in Europe.

In 1328 the seat of the monarchy was fixed at Brussa, under the shadow of Mount Olympus, and Asia Minor was conquered to the Hellespont. The history of Turkey proper begins with the reign of Othman; he was bold and brave, loyal to friends, cruel to foes and possessed the vices of the conqueror and the virtues of the leader. His immediate successor was his son Orkhan, who assumed command of the armies at the death of his father in 1326. He organized the Janissaries, a body of paid infantry, highly trained and fearless of foe or danger. By marriage he formed an alliance with the Greek emperor and also secured the diplomatic friendship of the Genoese, who were then among the commercial rivals of the Mediterranean. Solyman I invaded Europe in 1355 and Amurath I took Adrianople in 1360 and made it his capital. For many years the waves of Moslem invasion rolled over European battlefields. At times the Moslem armies seemed destined to conqueror the world; Macedonia, Albania and Serbia fell before them. Christian forces flocked together to stem the flood, from Hungary, Italy and the upper Danube; but the Turks defeated the combined armies at Kossovo, 15 June 1389. Sultan Murad was killed the same day; his successor, Bajazet I (q.v.), who was surnamed Yilderim (thunderbolt), had a sanguinary and unsuccessful reign. He began by attacking and taking the dominion of his father-in-law, the Prince of Phrygia. He next suffered a defeat in Europe at the hands of Stephen, sovereign of Moldavia, after which he was suddenly called to suppress Caraman Oghly, a petty Asiatic ruler, whom he speedily crushed, besides taking several provinces in Armenia. Returning to Europe, Bajazet captured some towns on the Danube and nearly the whole of Wallachia. King Sigismund of Hungary called upon the princes of Christendom to repel the Turk. He received a confederate army of some 100,000 Christians under his command; they were defeated by Bajazet with 60,000 men. The Empire of the East, almost reduced to the city of Constantinople, lay invitingly open to Turkish attack. John, son of Andronicus, sought the aid of the sultan against his uncle, Manuel, promising to cede the city on condition that he be allowed to retain the sovereignty over what the Greeks still possessed in the Morea. Bajazet sent him 10,000 Turks, who ravaged the country round the city and compelled Manuel to hand the empty title of emperor to John. Bajazet's schemes of conquest were suddenly arrested by a call to defend his own territory against the redoubtable Tamerlane, who with his Tatar hordes conquered with remarkable rapidity Persia, Mesopotamia, Asiatic Sarmatia and Syria, and forced the gates of Baghdad. The sultan hastily collected a large army and encountered Tamerlane on the plains of Angora (Ancyra) on 28 July 1402. In a fierce battle the Turks, outnumbered, were defeated and Bajazet was taken prisoner. He died the following year of grief and humiliation, in the train of his conqueror. Tamerlane reinstated all the Mohammedan princes who had been dethroned by Bajazet and returned to Samarcand without retaining any of his conquests. An interregnum followed from 1403 to 1413 under Solyman and Musa, two worthless sons of Bajazet. Neither is included in the Turkish roll of sultans. Both were killed in civil strife and the throne fell to their youngest brother, Mohammed I, who reunited the empire, reigned with moderation and justice for eight years and restored much of the national glory lost by his father. During his reign the Grand Vizier Ibrahim organized a Turkish navy, which was destroyed by the Venetians. Murad II (reigned 1421–51) captured Thessalonica (1429), besieged Belgrade in 1435 (on which

occasion artillery was first used against the Turks), defeated a confederation of European princes under King Ladislas of Hungary at Varna, 10 Nov. 1444, and finally defeated the Hungarians under Huniades in 1448. His reign was troubled with conspiracies and pretenders, besides suffering discomfitures at the hands of Scanderberg (q.v.). In 1451 Mohammed II (q.v.) became sultan, one of the most perfidious and sanguinary rulers that history exposes to the execration of posterity. The outstanding event of his long reign (30 years) is the capture of Constantinople (1453), though his whole life may be described as one long campaign, in the course of which he conquered two empires, 12 kingdoms and nearly 300 towns. What he accomplished as a conqueror for the advancement of the Ottoman Empire caused the Turks to regard him as the greatest of their sultans, and in their eyes the glory of his conquests atones for his many vices. He made Constantinople the capital of the empire. He attacked and conquered successively the Morea, Serbia, Bosnia and Albania; from the Venetians he took Lemnos and Negropont; from the Genoese, Caffa; he made the Crimea a dependency of Turkey in 1475, while Otranto in southern Italy belonged to Turkey when Mohammed died, though it was soon reconquered. Greece fell under the Turkish yoke; the empire of Trebizond was conquered in 1461. The island of Rhodes, defended by the Knights of Rhodes, held out against the Turk; the mountain district of Montenegro, in a ceaseless warfare of over 400 years, withstood the Turkish might. The Ottomans were now brought into the neighborhood of Poland, Lithuania and Russia. Greeks, Slavs and Albanians came under Turkish dominion, overcome by the arms of their own children, for the Janissaries, which formed the main strength of the Ottoman armies, were recruited from kidnapped children of the conquered nations. The conquests of Mohammed gave the Ottoman Empire in Europe nearly the same extent it had up to 1878, when the Berlin Congress began the dismemberment of the empire.

The next sultan, Bajazet II, who reigned from 1481 to 1512, was neither a man of war nor a genius like his father. His wars were confined to winning a few points from the Venetians and making raids into Hungary and other Christian lands to the north, committing unspeakable atrocities which provoked retaliation on the part of the Christians. Under Selim I wars of conquest were waged against Mohammedan enemies. He drove the Persians to the valley of the Euphrates and the Tigris. In 1517 he added Palestine, Syria and Egypt to his empire and took over the spiritual authority of the caliphate from a fugitive line of caliphs settled in Egypt. From that time the sultans have combined in their persons the dual rôle of emperor and spiritual head of the Moslem world. Selim outdid his predecessors in systematic bloodthirstiness. When he proposed to massacre all the Christians in his realm and to abolish the practice of the Christian religion, he was sternly opposed and turned from his project by the Mufti Djemali, an honest expounder of his own law and a righteous man. Remembering the humiliating defeat of his grandfather by the Knights of Rhodes, Selim made vast preparations to renew the campaign, when death cut him down, 22 Sept. 1520. His son, Suleiman (or Solyman) the Magnificent, succeeded and reigned 46 years, the most glorious period, according to historians, of the Ottoman dynasty. Allowing for some of those occasional crimes which seem inseparable from every Eastern despotism, Suleiman may be regarded as a good ruler according to his light. He took Rhodes (1522) from the Knights, who withdrew to Malta and became the Knights of Malta. He took Belgrade in 1521 and on the field of Mohacs (1526) subdued half of Hungary. The Turkish armies were the terror of the world and the «Conquering Turk» was a mighty power by land and sea. The north and south coasts of the Mediterranean had been conquered or laid waste; many of the countries of Europe had been conquered in whole or in part and all the rulers trembled. Germany was threatened, but the walls of Vienna (1529) checked the advance of Suleiman's army. The Christian nations suspended for a time their dissensions to marshal their forces against the Turks. The Ottoman Empire seemed strong, almost invincible, but its weakness lay in internal dissensions, for the conquered nations, although subdued, were perennially rebellious. Having settled affairs in Hungary and Wallachia by treaties, Suleiman turned his attention to Persia, where, after some initial defeats, he found himself landed in a war that extended over a period of 20 years. During that time the sultan took large tracts of Armenia and Mesopotamia, together with the strongholds of Van, Mosul and Baghdad. The Turkish navy swept the Mediterranean, the Red Sea and the remote waters of the Indian Ocean. A one-time corsair, Barbarossa, was appointed Capitan-Pasha of the fleet. This celebrated warrior captured Algiers and installed his brother as sovereign; he next defeated the galleys of the Genoese and devastated their coast. Turning to the Italian coast, he took several towns in Calabria, terrorized Naples and even Rome, and then sailed for Africa and made himself master of Tunis. Charles V formed an alliance with several Christian princes and set out for the African coast at the head of a powerful fleet to try conclusions with Barbarossa, who was severely defeated. Tunis was devastated as mercilessly as the Turks themselves could have done it. The Emperor Charles then laid siege to Algiers, lost great numbers of his troops by disease and 140 vessels in a tremendous storm off the Barbary coast. Suleiman now turned his whole naval force under Barbarossa against the Venetian Republic. After ravaging the Archipelago and capturing many of the islands, Barbarossa encountered the combined fleets of Spain, Italy and Venice off Previsa. In the battle that ensued the Turkish admiral gained a decisive victory and Venice sued for peace. From the death of Suleiman I in 1566 the power of Turkey began to decline; the race of rulers degenerated as a whole, not even retaining the military courage and daring of their predecessors. From 1300 to 1566 Turkey was the first military power in Europe. Under Selim II, son of Suleiman, the Turks were first brought into armed conflict with the Russians, thus inaugurating an implacable antagonism that extended down to the 20th cen-

tury. In August 1571 the Turks captured Cyprus from the Venetians, but two months later a maritime league of Austrians, Spaniards, Venetians and the Knights of Malta crushed the Turkish fleet in the battle of Lepanto (q.v.) and temporarily extinguished the fear of an extension of Mohammedan rule in the West.

From Murad III (reigned 1574–95) there follows for 300 years a train of 22 sultans of whom none can be described as noteworthy — until the accession, in 1876, of Abdul Hamid II. Murad III began with having his five young brothers murdered. He raised a cook to the position of Grand Vizier, fought a moderately successful war with Persia and hastened his death by intemperance and debauchery. Mohammed III (1595–1603) went even further than his father in causing his own 19 brothers to be strangled in his presence. He gained some military successes in the Balkans over the Archduke Maximilian and was himself carried off by the great plague in Constantinople a few months after he had put to death his eldest son, Mahmoud, a public favorite. Achmet I (1603–17) encountered revolutions and plague and was defeated by the Persians. Mustapha I (1617) emerged from long captivity to ascend the throne, proved his utter incapacity and was incarcerated in a tower four months later. Othman II succeeded at the age of 14. He introduced the death penalty for drinking wine and made an attempt to conquer Poland, which failed. A revolt of the Janissaries released Mustapha from the tower and replaced him on the throne, while Othman became a prisoner and was strangled in his cell after a brief reign of four years (1622). Within little over a year Mustapha was sent back to his prison as a lunatic. During that short reign the country fell into anarchy and desolation; revolutions in Asia Minor and defeats by the Persians made a new ruler imperative. Murad IV (1623–40) was 13 years old when he stepped into his heritage and quickly gave evidence of a resolute and tyrannical disposition. Insurrections and disasters marked his reign; the Lebanon tribes revolted; the Tatars of the Crimea rose in arms, cut up a Turkish force and ravaged the Black Sea and Bosporus shores; the Persians overran Turkish territory; the treasury at home was empty and the people starving; the soldiers mutinied in the capital and murdered the Grand Vizier; death reaped a bloody harvest throughout the country for months before order was restored. Murad led an army against Persia, reconquered Baghdad and butchered some 25,000 persons of both sexes and all ages (1638). The sultan drank himself to death and was succeeded by his brother Ibrahim (1640–48), the sole surviving male representative of the house of Othman. The new sultan at once plunged into ferocious debauchery. He ordered wholesale executions and was finally strangled after a disgraceful reign of nine years. Mohammed IV (1648–87) was seven years old on his accession. The early part of his reign was marked by all the disorders of a state without a head. Six viziers were deposed or strangled in a few years; the Janissaries and other troops murdered each other wholesale; the Turkish fleet was defeated several times by the Venetians, who took Lemnos and Tenedos, but soon lost those islands again. The pasha of Aleppo broke out in rebellion and was crushed; disturbances in Wallachia led to a great European campaign in which the Turks were opposed by Germans, Austrians, Poles and Hungarians. In July 1664 it seemed that the road to Vienna lay open to the Osmanlis, when the allies inflicted a severe defeat on the river Raab. The city of Candia, in Crete, was again vigorously attacked by the Turks, who had besieged or blockaded the place for nearly 20 years. It now occupied another two years' conflict to compel the Venetians to surrender, 6 Sept. 1669, and the island was added to Turkey. The war against Poland, conducted by the sultan in person, was at first a success for the Turks, who received Podolia and the Ukraine in addition to an annual tribute. In the second stage the tables were turned by the gallant Sobieski. For about 30 years the master minds directing the political and military destinies of Turkey were the Grand Viziers Mehemet and Achmet Kiöprili, respectively, father and son. On the death of the latter in 1678, his brother-in-law, Kara Mustapha, became Grand Vizier — a totally different character from his two brilliant predecessors. His one ambition was the conquest of Vienna, which plan he proceeded to put into execution with an army of about 300,000 men composed of Hungarians (then in revolt against the emperor of Germany), Turks, Tatars, Moldavians and Wallachians. Kara Mustapha reached Vienna with but little opposition and laid siege to the city in the middle of July 1683. The Duke of Lorraine threw 10,000 men into the city just before the arrival of the Turks. The defense made a gallant stand under Count Rüdiger von Stahremberg until the arrival of Sobieski (who was now king of Poland), with Polish, Saxon and Bavarian contingents numbering altogether some 70,000. With this army he attacked the Turks, and, aided by the Duke of Lorraine, fought a sanguinary engagement (12 Sept. 1683) lasting throughout the day. The Turkish host was routed with enormous loss and its camp given over to pillage. For his failure Kara Mustapha was officially doomed at Belgrade to strangulation; his severed head was carried to Constantinople and exhibited in public. The signal defeat of the Turks before Vienna was joyfully hailed throughout Christendom as presaging the downfall of the Mohammedan power in Europe. The empire was attacked on all side. The Venetian Republic declared war and captured several Greek cities from the Turks; Sobieski scattered the Turkish forces and reduced Slavonia and Transylvania. The sultan's troops, overwhelmed with defeat and disaster, revolted against the government. Mohammed lost his throne and was shut up in the same prison from which his brother Suleiman was now released (1687) and girt with the sword of Othman. Suleiman II was 46 years old and had passed the greater part of his life in confinement. A fresh outbreak of the turbulent Janissaries carried riot and murder through Constantinople. They attacked the Grand Vizier's palace, killed that dignitary and murdered the inmates of his harem, whose mutilated bodies were dragged through the streets. The Austrians and their allies harassed the Turks in Hungary, Bosnia and Serbia, retaking Erlau, Gradiska and Belgrade, while the Venetians conquered sections of Dalmatia,

Before the end of Suleiman's second year the Turks had lost all their conquests north of the Danube excepting Temesvar and Gross Wardein. Kiöprili-Lade Mustapha, a son of Mehemet Kiöprili, was appointed Grand Vizier. He restored order and confidence, abolished abuses, administered even-handed justice and enforced religious toleration. He led a successful campaign against Belgrade and defeated the Germans near Essek in 1689–90. Suleiman died in 1691, having reigned barely four years. His brother, Achmet II (1691–95), was an incapable weakling. Kiöprili fell in battle with the Austrians and his army was routed. Famine and pestilence fell upon Turkey; the imbecile ruler died and was followed by a worthier monarch, Mustapha II (1695–1703), who announced that he would himself begin the Holy War against the "unclean Christians." At the outset his Danube campaign proved successful but he came to grief at the battle of Zenta, in Hungary, on 11 Sept. 1697, when the Austrians under Prince Eugene attacked the Turkish army as it was crossing a temporary bridge over the Theiss (Tisza) and, the cavalry being already across, cut it in two and completely routed the infantry, driving them into the river. The prince lost only 500 against the Turkish losses of 30,000. About this time the young Tsar Peter (the Great) of Muscovy sought to open a permanent (ice-free) water communication with the West, with civilized countries, through the Baltic or the Black Sea. But the first belonged to Sweden and the second to the Turks, while the Caspian was in the hands of the Persians. Existing treaties with Poland and Austria, as well as policy and religion, urged the tsar against the Turks, and Constantinople has always been the point of attraction for orthodox Russia. Peter decided to attack by the Don and besiege Azov, the key to the sea of that name and whence the Turks made their plundering expeditions. An army of 100,000 men, many of them French (according to Voltaire), and other foreigners, formed the heart of the expedition. The attempt failed owing to the lack of a fleet to invest Azov from the sea and the siege was raised in 1695. Within less than a year Peter had constructed a fleet of 22 galleys, 100 rafts and 1,700 boats by 26,000 workmen assembled at the small ports of the Don. By July 1696 part of the outworks of Azov were captured and before the great assault was begun the place surrendered. This important event secured the Black Sea traffic to Russians and set a limit to Turkish power in that quarter. Ottoman power was practically broken by the Peace of Karlowitz on 26 Jan. 1699 between Austria, Poland, Russia, Venice and Turkey. Under that treaty Turkey ceded to Austria Transylvania, all Hungary north of the Marosch and west of the Theiss and all Slavonia except a small part between the Save and the Danube. A 25-years' peace was also stipulated. With Poland and the Venetian Republic terms of peace were agreed to without limitation of time. Venice retained her conquests in Dalmatia and the Morea; Poland recovered Podolia and Kaminietz. The truce with Russia gave her Azov and was at first for only two years, but was afterward extended into a peace for 30 years. Mustapha was deposed in a revolution in 1703 and died a year later.

Achmet III came to the throne in 1703 after having spent his 30 years of life in his prison home. But he had spent part of his time in the profitable study of politics and government, so that, unlike most sultans, he was not altogether unfitted for his task. As soon as he felt himself securely installed he dismissed the Grand Vizier and Mufti and ordered all the ringleaders of the late revolution to be put to death. He next appointed another member of the eminent Kiöprili family to be Grand Vizier, but the efforts of the latter failed before the internal confusion and discord. The public and officials turned against him and he was dismissed 14 months later and replaced by Baltadji Mehemet Pasha, a man risen from the people. Externally the country was at peace. After the defeat of Charles XII at Pultova by Peter the Great on 8 July 1709, the Swedish king made his escape from the field by swimming the Borysthenes. He fled to Bender, in Bessarabia, then Turkish territory, where he collected the remnants of his army — some 18,000 men — and endeavored for two years to entice the sultan into war with Russia. Achmet III was anxious to recover Azov and, therefore, ordered his Grand Vizier to put army and fleet on a war basis by raising a force of 200,000 men (August 1710). War broke out in 1711. Peter the Great set out for Poland in March, accompanied by his wife, Catherine. In the ensuing struggle the Russian army got into difficulties on the Pruth from lack of provision and the defection of Moldavia and Wallachia. The Turks and Tatars, though suffering heavy losses in a two days' battle, forced the Russians almost to the point of surrender when the Empress Catherine, who attended a despondent council of war in camp, suggested bribing the Grand Vizier, a notoriously avaricious man. Catherine gave her jewels and 200,000 rubles were collected and sent to the Turkish camp. Peter at the time lay sick in his tent, reluctantly consenting to make peace proposals. The Grand Vizier Baltadji agreed to make peace on remarkably mild terms, though the Russian envoys had been instructed to accede to any terms and sacrifices. By the Treaty of the Pruth (21 July 1711) Azov was restored to Turkey and the Russian fortresses built on Turkish territory at Taganrog, Saton, Kamennov and elsewhere were to be demolished, while the Azov Sea fleet was to be burnt. Further, Charles XII (who had not accompanied the Turkish army) was to be allowed to return to Sweden and left in peace by Russia. Peter the Great never recovered from this humiliation and it might be said that from this time Russia and Turkey were nearly always at war. In 1714 Turkey was again at war with the Venetian Republic. Austria intervened and declared war on Turkey and later dictated the Treaty of Passarowitz (21 June 1718), by which Austria obtained Belgrade and other cities, extending her influence over large portions of Wallachia and Serbia. The Turks lost Hungary. The interests of Venice suffered; the Morea was again confirmed to Turkey. In 1723 Peter the Great joined Turkey in an attempt to dismember Persia, a co-operation that was short-lived Mustapha III, who reigned from 1757 to 1774, became alarmed at the growing strength of Russia and demanded that Catherine II should remove her army from Poland. But during

TURKEY

1 Mosque of St. Sophia at Constantinople

2 Interior of St. Sophia

her reign the Russians ravaged the Crimea and put an end to Turkish rule in the peninsula, while the Wallachian army conquered Bessarabia, including Bender, and penetrated into Bulgaria. While Turkey was preoccupied with the revolt in Egypt, which broke out in 1768, Catherine prepared further disaster for the Ottoman Empire. A Russian fleet defeated the Turkish navy at Chios and annihilated it in the port of Chesmé with British aid. The Russian commander, Alexis Orloff, delayed his projected attack on Constantinople and found the Dardanelles had been too strongly fortified in the meantime. But the Russians had recovered Azov, the Crimea, the shore of the Black Sea between the Dnieper and Dniester and made important gains in the Balkans. By the Peace of Kutchuk-Kainardji in 1774 Turkey was compelled to yield the Russian conquests, acknowledge Russian protection over the Christian subjects of the sultan and to open the Bosporus and Dardanelles to Russian merchant ships. In 1787 Turkey again declared war against Russia, but suffered defeat except at the battle of Belgrade, where the force under Selim III was victorious. The Peace of Sistova (1791) ended the wars between Austria and Turkey. Russia began another war against Turkey in 1807 and succeeded in nearly every encounter. The insurrection in Greece at the time when the Turkish army was engaged elsewhere was a severe blow to Mustapha IV. The Peace of Bucharest in 1812 closed a six years' struggle in favor of Russia. The Serbians rose against the Turks in 1815; Greece revolted in 1821 and declared her independence of Turkey in 1822. At the naval battle of Navarino (20 Oct. 1827) the allied fleets of France, Great Britain and Russia annihilated the Turkish and Egyptian fleets, thereby assuring Greek independence. A short war raged between Russia and Turkey in 1828–29, the latter being the loser. The Turkish war with Ibrahim Pasha is related under Egypt (q.v.).

Crimean War Period.— Up to the middle of the 19th century the Ottoman Empire had exerted a tremendous influence upon the history of Europe for over 400 years. The Turks had proved themselves not only redoubtable warriors, but a distinct peril to Western civilization and Christianity. The Turk conquered for the sake of conquest; he devastated and massacred, but made no effort to colonize or introduce tolerable government. In all the territories that fell under his sway the Turk was ever in the minority; he was not assimilated with the natives nor they with him; he was ever a stranger to the soil and his "government" merely an army of occupation to suppress the natives. The Mohammedan Turk looked down on those of other creeds with contempt: they could not be placed on a level with him. The conversion to a foreign creed was practically an impossibility except under compulsion. Islam found its converts only among those who had no religion of their own. Despite their frequent wars among themselves, all the other nations of Europe have certain interests and ideals in common — in commerce, literature, polity, religion, science, etc. The Turk shares in none of these excepting, perhaps, the material one of commerce. From the early incursions of the Ottomans into Europe, as has been shown, there were frequent coalitions among European states to resist the invader. It was reserved for the 19th century to witness the anomalous spectacle of Christian nations rushing to the defense of the Turk and the preservation of his dominions — at least in Europe. This political phenomenon is known as the "Eastern Question," which is treated under that head. The first important manifestation of this policy was the war in the Crimea (q.v.). Already in 1853 the Tsar Nicholas I described Turkey as the "Sick Man of Europe" to the British Ambassador and proposed a division of his property when the patient should die. The old Russian ambition for Constantinople has been mentioned. The other Turkish possessions in Europe at that time contained populations of more or less well-marked races which could be set up as independent states — as they eventually were. The Crimean War, in which France and Great Britain fought on the side of Turkey against Russia, resulted practically in a draw, though Russia was obliged to make important concessions to her rival by the Treaty of Paris.

In 1875 Bosnia and Herzegovina broke into open revolt, stung to desperation by intolerable abuses, and in February the six European powers launched the Andrassy Note, the first of a long succession of similar documents, most of which have been delivered in the same fashion, only to meet the same fate. The note demanded administrative reforms on a liberal scale, but nothing came of it. Though nominally acting in concord, the Powers at this epoch were far from being in harmony. The note having failed in its object, Prince Gortschakov, Prince Bismarck and Count Andrassy met in Berlin and framed the "Berlin Memorandum" (q.v.), in which the signatories declared it futile to accept the sultan's bare word and promise for reforms, and demanded material guarantees. The effect of the memorandum was nullified by Lord Derby's objection to the principle of interfering with the integrity of the empire, but it was published and noted by the Turks, though never formally handed to them. The Bulgarians broke out in insurrection in April, but were easily crushed with relentless ferocity. The internal condition of Turkey went from bad to worse and the financial situation became desperate; the interest on the public debt amounted to nearly $70,000,000, out of a total revenue of $100,000,000. Payment was stopped, Turkish stocks fell 50 per cent and the populace grew more and more furious against their rulers. Frequent demonstrations were made by the turbulent Softas (students), and at length the Grand Vizier and the Sheikh-ul-Islam were ejected from office, while Midhat Pasha, the leader already of a Turkish reform party, was given a place in the ministry. Within two weeks of this change the palace was silently surrounded with troops, the Sultan Abdul Aziz was made prisoner and dethroned by his ministers on a *fetvah* from the Sheikh-ul-Islam. Murad V was placed on the throne, and Abdul Aziz was found dead in the Cheraghan Palace 4 June 1876. According to the verdict of a number of European doctors he had committed suicide by cutting the veins in his arms with a pair of sharp-pointed scissors. The advent of Murad

was hailed with popular enthusiasm, as he was supposed to be liberal-minded and inclined toward political liberty. A short time, however, revealed that he was a weak-willed creature, quite unable to check the high-handed proceedings of his Cabinet, and on 31 Aug. 1876 he was unceremoniously deposed, not secretly, as his uncle had been, but deliberately and openly, and Abdul Hamid II, his younger brother, became sultan. For 28 years Murad lived a state prisoner; his death was announced 31 Aug. 1904.

Abdul Hamid at first gave no sign of his latent strength and energy. Not long before his accession Serbia had suddenly declared war on Turkey and proclaimed Milan Obrenovich «King of Bosnia and Serbia.» The storm of Turkish butchery and outrage turned loose in Bulgaria (see BATAK) roused the indignation of the civilized world and led to European diplomatic intervention. The British government presented a comprehensive «reform scheme» and proposed a conference to devise means for enforcing its execution. Although Midhat Pasha, now the Grand Vizier, was himself an advocate of reform, he believed that Turkey was capable of looking after itself without interference. Within two months of his accession the sultan played his first *coup*, designed to cut the ground away from under the feet of Europe by first promulgating a reform scheme of his own, even more comprehensive than the British one, providing for a constitution, a parliament, a premier, open courts, freedom of the press and all the administrative furniture of a modern state. Midhat was dismissed and banished on 5 Feb. 1877. Elections were held, several Christian deputies chosen and the Parliament was opened with a fanfare of trumpets and salvos of artillery on 19 March 1877. The speech from the throne, read by the sultan's first secretary, entered at great length into the condition of the empire and declared that the Constitution was intended to secure liberty, equality and justice to all. Almost for the first time the East was adopting one of the most distinctive institutions of the West. But the innovation, unfortunately, was launched at a critical time: civil war raged in the Balkans; Serbia, under armistice, was unfriendly; Greece was watching her chance to seize Thessaly; Crete and Montenegro threatened and, above all, war with Russia seemed imminent. The Powers, however, were determined on a conference, which was held in Constantinople and soon ended in smoke. The Tsar Alexander declared war on Turkey 24 April 1877 and lost no time in moving his troops across the Pruth. While the war was in progress the sultan prorogued his Parliament on 14 Feb. 1878 and it remained closed for 30 years. In the course of the war the Russians advanced almost to Constantinople, and it seemed that the age-long aspiration of expelling the Turk from Europe would be soon realized. Incidentally, Russia would also become mistress of the city of the Bosporus in accordance with the famous «testament» of Peter the Great. But the other powers of the Concert flamed out in jealousy of Russia and the British government actively intervened to save Turkey. Even the Treaty of San Stefano (q.v.), which Russia exacted from Turkey, was not allowed to stand, the Berlin Congress cutting down the Turkish sacrifices of territory. However, Rumania, Serbia and Montenegro were released from Turkish suzerainty and Bulgaria was left in only nominal dependence. Bosnia and Herzegovina were placed under the administration of Austria and a small part of Armenia was ceded to Russia. The treaty further obligated the sultan to introduce reforms into the remaining Christian provinces--an obligation that still lacked fulfilment at the close of the European War 40 years later. The result of the war was by no means very disastrous to Turkey; the loss of the Balkan principalities had long been inevitable, but she was still permitted to retain suzerainty over eastern Rumelia, which in 1885 broke away and united with Bulgaria. Turkey also lost Kars and Batum to Russia. The most serious blow was the war indemnity, but Russia proved indulgent and consented to easy instalments, thus providing herself with a Damocles' sword over Turkey. Just before the signature of the treaty, Great Britain concluded the Cyprus Convention, taking over the administration of that island and in return undertaking to defend Turkey in case of Russian aggression in Asia Minor. In 1881 Midhat Pasha was tried for alleged complicity in the murder of Abdul Aziz. He was «found guilty,» exiled to Arabia and finally strangled.

In 1882 the Arabi Pasha revolt broke out in Egypt, and the sultan at the outset encouraged it, as being directed against the growing dictation of Europe personified principally by the Dual Control. The viceroy Ismail had been deposed and held a prisoner in Constantinople, and his son Tewfik was running with hare and hounds, being also in partial sympathy at first with Arabi and his army, whom he knew to be working with the tacit approval of his suzerain. Later on, when the British expedition arrived, Tewfik threw over the rebels, though it was he who gave the order to return the fire of the British fleet. The sultan was invited to send his own troops to Egypt, but for some reason never made clear he declined the British invitation. The result has been the definite loss of Egypt, although the suzerainty had already become purely nominal under Ismail. By 1885 the Ottoman Empire had been shorn of Serbia, Rumania, Bulgaria, Montenegro, eastern Rumelia, Egypt, Cyprus, Tunis and Thessaly. A comparative calm reigned after the settlement of the Bulgarian question and Abdul Hamid devoted himself principally to improving his army and extinguishing all internal opposition to his arbitrary rule. It was not until the Armenian question loomed upon the horizon that European diplomacy again roused itself to activity on the shores of the Bosporus, though there was now a different grouping of influences. Since the war, Russia had been viewed with justified mistrust, and the sultan had leaned upon the Triple Alliance, headed by the German emperor, who had almost openly posed as his friend and protector in Europe, as Great Britain had bound herself to be in Asia. When Abdul Hamid saw signs of disruption between members of the Triplice, and England drifting into trouble both with Russia and France, who were joining hands, he decided to reverse his policy

and turn to Russia as a friend. No exact date can be fixed for this change, but it may roughly be said to have been inaugurated about 1889–90. It was at this time that the beginnings of disorders in Armenia were reported. Early in 1890 the churches of Erzerum were broken into and profaned, while a score of Armenians were killed and wounded. The Armenians then decided that their only hope of salvation was, at any cost, to bring about European intervention. The Trochak, a Russian branch, instituted a system of anarchism, bombs and dynamite, by which they counted on provoking the sultan to such massacres as should force the intervention of Europe. So far as the massacres went, their calculation was correct; but Russia, who was distinctly opposed to any establishment of an autonomous or independent Armenia, invariably hampered any proposal for active coercion of the sultan. That monarch, being confident of the non-participation of Russia, if not of her positive help in case of any act of force by other European powers, and also being steadily encouraged by Germany, took little heed of the threats and warnings issued by a Concert no three of whose members had the same views and almost all of whom were certain to protect him from aggression on the part of any one power that might attempt such a thing. The Sassun massacres of January 1895 brought more protests from European governments, to which the sultan replied that he was then engaged upon a project of reforms which he hoped to communicate within a month. Nothing happened up to September, however, when the Armenians organized a demonstration at the Porte, which was followed at once by a wholesale butchery all over Stambul, Galata and Pera. This was only a beginning, and for the next few months there was scarcely a district in Asia Minor which did not run red with the blood of Armenians. In spite of the most energetic paper remonstrances of the Powers singly, collectively and in groups, not a single individual was punished. At first, after the Convention of Cyprus, the task of guarding the rights of the Christian population was supposed to devolve chiefly upon Great Britain, who appointed military consuls and up to a certain point succeeded in remedying a few abuses. But toward 1890 — as soon as Russia had come to some terms with Turkey — Great Britain lost all influence. She appealed to all the signatories to the Berlin Treaty when the Sassun massacres took place, but only France and Russia responded, and they, apparently, only to prevent England from acting alone. The reform scheme eventually submitted by the six ambassadors, quite apart from its inherent defects, was foredoomed to failure from the certain knowledge of the sultan that Russia did not really recognize the existence of any Armenia; also that Germany had no particular interest in Asia Minor, as she carelessly stated, and that England did not consider the scheme as sufficiently guaranteed, but wanted something more which the other Powers would not back her in asking or obtaining. In fact, directly England wished to insist upon an immediate and categorical answer from the sultan, Prince Lobanoff wired from Saint Petersburg to the Russian Ambassador that "in no case would Russia co-operate in coercive measures, nor, indeed, would she consent to the establishment of a privileged Armenian province or provinces" (which England was pressing for) "to serve as a nucleus for a possible future Armenian kingdom." After months of fruitless discussion the sultan again emerged triumphantly from the contest by substituting another scheme of his own — which never materialized.

Having thus entirely defeated the fictitiously united Powers, the sultan turned his attention to the Young Turkey party, a group or relic of the Midhat faction which aimed at the regeneration of the empire by utilizing the best Moslem elements without interference or control from Europe. Its first article was ministerial responsibility, as opposed to palace autocracy, with ultimate ideas of representative chambers for legislation which should put an end to the worst abuses and raise the country from the slough of corruption into which it had fallen. In short, the Young Turks' object was to curb the arbitrary exercise of power by the sultan and give to every Turk and Christian some sort of legal status, though it was scarcely likely, having got rid of Midhat Pasha and all his associates by means of trumped-up charges and judicial murders, that Abdul Hamid would permit the seed sown by them to ripen and bear fruit. The chief sources of danger were the Softas and the students in the naval and military academies. Accordingly, these were mercilessly pursued with torture, drowning, beating and exile. As he had cowed the Armenians, so the sultan resolved to break the spirits of the Young Turks. Unlike the Armenians, they had not the passive sympathy of foreigners behind them, and they lacked the necessary finances. Not that cash was wanting among the people, but any man who ventured to subscribe was sure to be denounced and spirited away.

At the beginning of 1897 the sultan was probably stronger than ever before, despite the furious assaults made upon him by ostensibly united Europe. The Cretans once more broke out into revolt. Not only did the Powers refuse to let the sultan send more troops to the islands, but demanded that a large portion of those already there should be withdrawn. The Greeks then landed an expeditionary force under Colonel Vassos and proclaimed the island annexed to Greece, but the Powers protested and blockaded Vassos with a mixed fleet. The sultan speedily mobilized a large army on the Thessalian, Bulgarian and Serbian frontiers. Despite all warnings from the Powers, the Greeks raided Turkish territory and the sultan declared war upon Greece, with the consent, be it noted, of the Powers themselves. In a few weeks Greece was beaten to her knees, and now the Concert headed by Russia intervened, deprived the Turks of the spoils of victory, ordered them to evacuate conquered Greek territory and created the island an autonomous state under the high commissionership of Prince George of Greece, an arrangement which lasted till 1906. By the Balkan wars of 1912–13 Crete was finally annexed to Greece.

The outstanding events of Turkish history during the first 15 years of the 20th century were the perennial Macedonian feuds, an irregular civil war between Serbians and

Albanians on one hand and Greeks and Bulgars on the other, both being freely assisted by guerrilla bands from beyond the frontier. Bulgarian villages were attacked and their inhabitants assaulted or murdered by Greeks, while sanguinary conflicts occurred between Turkish troops and Bulgarian bands. The international gendarmerie established by the Powers was unable to cope with the insurgents, and its operations were impeded by the inefficiency and corruption of the judiciary. A revolt in Yemen and the lack of funds prevented the sultan from dealing with the difficulties besetting him on all sides. In 1907 the Porte, still suzerain over Bulgaria, made remonstrance to the latter as to the persecution of the Greeks. All the Balkan states seemed on the verge of war; European intervention was powerless; massacre and outrage continued. The Turkish revolution, engineered by the Young Turks, broke out in 1908. Almost bloodless in execution, it led to the revival of the dormant Constitution and the prorogued Parliament of 1878. Abdul Hamid accepted the inevitable and transformed himself into an ardent reformer and a pattern sovereign according to the best Western models. He suddenly became almost the most popular person in the empire. On 5 Oct. 1908 Prince Ferdinand proclaimed himself tsar of Bulgaria and declared his absolute independence of Turkey; Austria annexed Bosnia and Herzegovina. Abdul Hamid was dethroned in 1907 and banished to Salonica; he died on 10 Feb. 1918. His brother, Mohammed V, succeeded to the throne and soon became a helpless puppet in the hands of the Young Turk leaders, Enver Bey and Talaat Pasha. Italy declared war on Turkey in 1911 and took Tripoli. Before that war was ended the Balkan League declared war on Turkey in 1912, which was followed by another war among the members of the league in 1913, the results of which were destined to have important consequences in the great European War which broke out in the following year. All the events here touched upon will be found fully described under the different headings given in the list of cross-references below. Separate articles are also devoted to all the prominent characters concerned. See ABDUL HAMID II; ARMENIA; BALKAN LEAGUE; BALKAN WARS; CANNING, STRATFORD; CONSTANTINOPLE; CRIMEAN WAR; EASTERN QUESTION; HEJAZ; MESOPOTAMIA; PALESTINE; RUSSO-TURKISH WAR; SYRIA; TURCO-ITALIAN WAR; TURKISH LANGUAGE; TURKISH LITERATURE.

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TURKEY, or THE OTTOMAN EMPIRE, Diplomatic Relations of the United States with. The opening of American diplomatic relations with Turkey, although delayed for nearly a half century after the achievement of American independence, was contemplated soon after the conclusion of the early treaties with the Barbary states. In 1798, following the formation of a European coalition (of Russia, Austria, England, Turkey and Naples) against France, the Russian Minister at London suggested to Rufus King (the American Minister at London) that the Russian government would be inclined not only to form a commercial treaty but also to use its influence in aiding the negotiation of such a treaty with Turkey. Mr. King while recognizing the advantage of such a treaty with Russia also discreetly admitted that extension and establishment of the American trade in the Levant would undoubtedly be an object of importance. On 11 Feb. 1799, William Smith, Minister Plenipotentiary to Portugal, was commissioned Envoy Extraordinary and Minister Plenipotentiary to Turkey, but did not go.

The first American vessel which raised the American flag in the Bosphorus was the American frigate *George Washington*, which was seized in 1800 by the Dey of Algiers and forced to carry an Algerian ambassador to Constantinople. For 30 years thereafter, American commerce in the eastern Mediterranean was conducted under the protection of the English Levant Company.

In January 1815, the Russian government in a note to Levett Harris, chargé at Saint Petersburg, offered to obtain through its Minister at Constantinople the good offices of the sultan in securing for the American government favorable arrangements with Algiers.

The first attempt to arrange commercial relations with Turkey on a treaty basis was made in 1817, and thereafter followed by various other unsuccessful attempts.

Finally in September 1829 President Jackson appointed for that purpose a commission composed of Commodore Biddle, David Offley (the American consul at Smyrna) and Charles Rhind of Pennsylvania. Rhind, who preceded the others to Constantinople, negotiated a treaty conceding trading privileges of the most favored nations and containing a separate secret article which allowed Turkey to purchase timber and to build ships in the United States. This Treaty of 1830, signed by the three commissioners, was ratified by the Senate only after rejection of the separate article. It was proclaimed 4 Feb. 1832. In exchange of ratification, which occurred at Constantinople, the American government was represented by David Porter of Maryland, who was commissioned chargé d'affaires on 15 April 1831 and later as Minister Resident on 3 March 1839. The first Turkish diplomatic representative in the United States was Blacque Bey who presented his credentials as Envoy Extraordinary and Minister Plenipotentiary on 23 Aug. 1867.

In 1868 a question arose in regard to the contents or stipulations of the original draft of the Treaty of 1830 which was found to differ from the translation ratified by the American Senate. The American government complained that the arrest and imprisonment of two Americans was contrary to Article 4 of the Senate version which provided for trial by the American Minister or consul in such cases; but the Turkish Foreign Minister replied that the treaty clause quoted was not in the original Turkish document and, therefore, was not correct.

Meantime, in February 1862, the two governments negotiated a new commercial treaty which changed minor provisions of the Treaty of 1830 but contained no provision in regard to extraterritorial jurisdiction. This treaty although valid for 28 years was terminable by a notice of one year before the expiration of either 14 or 21 years. In 1874 and again in March 1883 the government of Turkey gave advance notice, unaccepted by the United States, but neglected to submit the required notice at the proper time. It insisted that the notice of March 1883 was given properly and, therefore, that the treaty was abrogated after 5 June 1884. Soon thereafter, however, it invited the negotiation of a new treaty.

A third treaty with Turkey, an extradition treaty, was negotiated in 1874 and proclaimed 26 May 1875.

By the Treaty of 1830 the United States obtained recognition of the rights of its citizens to pass the Bosphorus and the Dardanelles and to enter the Black Sea which the Sultan until near the close of the 18th century had

guarded from foreign vessels as jealously as he protected his own harem from outsiders. This right for merchant vessels had been granted to Russia in 1774, to Austria in 1784, to Great Britain in 1799, to France in 1802 and to Prussia in 1806 and was finally granted to all nations by the Treaty of Paris in 1856 as modified by the Treaty of London in 1871. The American government, having never adhered to the treaties of Paris and London, claimed the right to send into the Black Sea ships of war which were prohibited to other foreign powers by the treaties, but while reserving all question of right it entered the Dardanelles in such case only after asking permission of the Porte.

Under the Treaty of 1830, which was the basis of all American rights in Turkey, the American government continued to claim the privileges of extraterritoriality. This contention, based upon an admitted mistranslation of the treaty, was opposed by the sultan's government; but American consuls have continued to exercise extraterritorial privileges in Turkey and in Turkish dependencies and in 1900, after the privilege for which America contended had been granted to other nations, the American insistence of right was placed on the most favored nation clause. In 1914 Turkey abrogated the privilege in the case of all nations. This action was promptly protested by the principal nations and the final outcome awaits the results of the peace negotiations terminating the war.

The question of naturalization long remained a prominent source of friction. The Turkish government refused to permit the return of its subjects who were naturalized in the United States after 1869, and frequently expelled them when discovered on Turkish territory. A naturalization treaty negotiated in 1874 to settle the controversy was approved by the Senate after amendment, but, because of various declarations attending the exchange of ratifications, was never proclaimed or put into effect. Later efforts to induce the government of Turkey to accept the treaty in the spirit contemplated by the Senate amendment were unsuccessful. Finally, in 1889, the Turkish government seemed willing to accept it, but following the reapproval of the Senate with a proviso against retroactive effects, it resorted to tergiversations and thereby prevented ratification.

The importance of an understanding to relieve disagreeable situations resulting from Turkish policy was emphasized in recent years by the increased immigration of Armenians and Syrians to the United States and was reflected in the recognition of larger importance of American diplomatic representation at Constantinople illustrated in the service of Oscar Straus whose triple embassy covered the years 1887–89, 1898-1901 and 1909–10.

Although Americans always openly sympathized with Christian nationalities subject to Turkey, the American government until recently hesitated to participate with the European concert of powers which so often intervened or remonstrated against conditions within the Turkish Empire. In 1894, following American Senate resolutions against reported "atrocities" by Turkish officials, President Cleveland, who had declined the invitation of Turkey to investigate conditions, decided that American action would prove inconvenient because of the European concert under the Treaty of Berlin. Later, the possibility of American intervention was indicated in the increased American indignation resulting from the Armenian massacres, and probably was prevented only by the influence of ancient traditions in causing the American government to avoid any action by which it might become involved in the mazes of the Eastern Question. More recently, American diplomacy became more active at Constantinople. This activity encouraged the proposal, at the close of the World War, that the American government assume a new responsibility by accepting the mandatory of Armenia, or in the execution of an international guarantee of the free passage of the Dardanelles.

The larger number of American diplomatic disputes with Turkey originated in questions concerning the educational and charitable institutions established in the Turkish Empire by American missionaries who insisted upon privileges under provisions of a series of old capitulations of sultans granting substantial self-government to foreign communities in Turkey. Although these capitulation rights were conceded by the government at Constantinople, their enforcement resulted in difficulties. In 1903 the government of Turkey recognized the justice of American demand for official legalization of American educational institutions in Turkey, based upon a similar privilege granted to France in 1901, but it failed to issue the necessary decrees until 1907, when the privileges were finally granted in return for certain commercial concessions. It failed, however, to acknowledge by treaty the American claims to indemnity for injury to missions or other American property in periods of internal disorder.

In 1906, after considerable opposition, the Sublime Porte finally conceded the demand of the American government to be permitted to raise the rank of its diplomatic representative from minister to ambassador, who thereby obtained the right of personal interview with the sultan to discuss official matters. This arrangement, first unsuccessfully proposed to Turkey by President McKinley, was especially necessary to remedy unsatisfactory relations as conducted through the irresponsible Turkish Secretary of Foreign Affairs.

Another subject of discussion resulted from increase of American commercial interests. In 1907 the American government successfully demanded an equal right with European powers to approve or disapprove proposed increases in Turkish tariffs. Recently American capital has been attracted by new opportunities for development in Turkish territory.

In conflicts between Turkey and the Balkan states and in the conflict between Turkey and Italy in Tripoli culminating in 1913 in the almost complete destruction of the Turkish Empire in Europe, the United States had "only a remote and detached interest," but in the later world conflict in which Turkey was an ally of Germany and Austria the American government recognized a duty which compelled it to participate actively in war against the Central Powers and in the subsequent peace nego-

tiations which determined questions relating to Turkey and her dependencies.

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TURKEY, or THE OTTOMAN EMPIRE, AND THE WORLD WAR. The Turkish Empire was from the very start an anomaly. When at the zenith of its power and expansion it embraced, like the Roman Empire of old, large tracts of land in the three continents, Asia, Europe and Africa. But at no time was it consolidated. Always it was a mere congeries of territories differing greatly one from the other in civilization, race, speech and religious faith. It was built on rude conquest, and was solely maintained by terror and arms. The dominant race in it, the Ottoman Turks, was always the minority and always, too, intellectually below par in comparison with the subjected majority. After 1540 the process of slow decay and disintegration set in. Under a few able rulers Turkey rallied somewhat, and in 1683, when Mustafa Pasha went with an army of half a million to lay siege to Vienna, the abnormal Asiatic power for the last time in history — like an expiring candle, flickering or flashing — practically closed its meteoric career. Since then it has, more or less justly, earned her nickname of the "Sick Man." According to whether the medicine administered by his keepers agreed or disagreed with him, Turkey's plight has for over 200 years past called urgently now for a cure or anon for a sleeping potion. Throughout the whole of Turkish history the relations of Turkey with the two western European powers, England and France, have been quite or almost friendly. Turkey was even a number of times the ally of one or both of them. Louis XIV of France throughout his long and troubled reign was in alliance with Turkey against the Hapsburgs. During the Napoleonic era England was Turkey's silent or outright supporter. In fact, England's political and economic interests were seldom running counter to those of Turkey. Her aim was all the while to maintain a feeble Turkey, but an intact one, especially since British India loomed up as important and as easy access to those rich possessions had to be kept open. France, it is true, had special interests in Syria, but these needed not necessarily to conflict with Turkish or French policies. During the Crimean War both France and England stood on the side of Turkey against Russia. Quite late, only since the period of Peter the Great, Russia collided with Turkey, but since then a score of wars were fought in which Turks and Russians faced each other with hostile intent. And for the space of 50 years one of the favorite Russian ambitions has been the destruction of Turkey and the acquisition of Constantinople. As for the Central Powers, Austria-Hungary and Germany, the former waged more frequently war with Turkey, ever since the fall of Christian Constantinople in 1453, than any other country. Twice Vienna was besieged by the Moslem Turks and their hosts, in 1529 and 1683. For 150 years nearly the whole of Hungary was under Turkish dominion. Transylvania was Turkish for even a longer space of time. During the 16th, 17th and 18th centuries Austria was almost incessantly at feud with Turkey. For a long time Austria constituted itself the champion of the Christian populations on the Turkish Balkan, until deprived of that rôle by Russia. With Germany political relations of more than temporary importance were of much more recent date. With Prussia, as the more bellicose portion of Germany, Turkey entered only into relations since the reign of Frederick the Great, the second half of the 18th century, and these relations were consistently amicable ones. But Turkey held rather aloof from Prussia and from the latter's creation, the new German Empire, even as late as the accession of its last ruler, William II, in 1888. Since then, however, there was a decided change. The Kaiser took infinite pains to strengthen the political and economic ties with Turkey. The Turkish army was reorganized by Prussian officers and put on a Prussian footing, the most effective work in turning the hitherto but loosely coherent and badly disciplined Turkish hosts into a formidable fighting machine being performed, at the behest of William II, by Gen. Baron von der Goltz, although from Moltke on a number of other efficient Prussian drill masters had devoted many years to the preliminary task. Other material bonds, as well as intellectual ones, followed in rapid succession. William II let no opportunity escape to assure Turkey of potential German support. During his trip to Palestine he grandiosely proclaimed himself the admirer and, in a manner, the powerful protector of not alone Turkey, but of the entire Moslem world. The national policy of Germany, as managed from Berlin, embraced a quasi-protectorate over decadent Turkey, with its threatening tentacles turned more especially toward Britain and British India. As relations with Germany became more and more intimate during the long reign of Abdul Hamid, financial and economic schemes began to multiply, all directed from the Foreign Office in the German capital. These latter culminated in the planning and partial construction of the Berlin–Bagdad Railroad, a line which was chiefly meant to serve Turkish strategical schemes in a future war wherein Russia, England and France should be involved, but which also was to connect by the briefest route Berlin with the Turkish part of the Orient, and to bring more especially Mesopotamia within the sphere of German influence and thus not only checkmate the British but to threaten permanently the approaches to British India. Anatolia to the northward, that is, the heart and source of purely Turkish power, was to be brought near the south on the Euphrates line. The complete economic conquest of Turkey, at the instance and with the earnest collaboration of the imperial staff at Berlin, was elaborately planned and had already in good part been accomplished when the World War broke out in 1914. The overwhelming bulk of the Turkish masses did not fall in with these projects, not even while during 1915

and 1918 the fate of Turkey trembled in the balance. But Enver Bey, the all-powerful War Minister, and Talaat Bey, the equally omnipotent Secretary of the Interior in Turkey, who completely terrorized the feeble and sickly sultan, Mohammed Rashid, were apt pupils of German statecraft, and until the complete collapse of Turkey came these two and their following had it all their own way.

The causes that induced Turkey late in 1914 to enter the World War on the side of Germany now lie clear before the eyes of the world. They are intimately connected with and lie enwrapped in the coming of the so-called Young Turk party to power. When in 1908 the absolutism of Abdul Hamid came to an end and the wholly unexpected and bloodless revolution that deposed him and in a sense modernized Turkey and its government so successfully brought the Young Turks with their Parisian ideas of liberty and progress on the stage, the entire West almost expected nothing less than a complete rejuvenation and liberalization of Turkey, and for a short time there were apparent signs of that. During this short transition period German national statecraft, which had strongly supported the personal régime of the autocratic Abdul Hamid, was under an eclipse. But the Young Turks very soon upset their own initial program, and from setting out as spokesmen of Western liberalism they turned into more ruthless advocates of force in the service of their ideals than had been Abdul Hamid himself. Instead of fostering a rational program of internal reform they became Nationalists, Panislamists, finally Panturanians. That is to say, their aims became the following: enforcement of a policy recognizing only the Ottomans as instruments and worthy servants of the state, and the rooting out by every means, of alien, that is, non-Turkish and non-Moslem elements within the Turkish Empire, such as Armenians, Syrians, Nestorians, Arabs; the spreading by persuasion or force of the doctrine that Turkey is the cradle and instrument of Islamic rule, within and abroad; the gathering into one fold, into one great state of the future, of the whole Turanian race. As early as October 1911, the Young Turk Congress adopted resolutions in favor of Panislamism throughout Turkey and of suppression of every other type of religious practice and faith. "Sooner or later," the resolution ran, "the complete Ottomanization of all Turkish subjects must be effected." Djelal Noury Bey, one of the chief mouthpieces of Turkish full supremacy, in a late work advocated strongly the "Turkification" of Mesopotamia, of Hedjaz and of Yemen, Arabia, and the Arabs were bluntly told that there "were neither Arabs nor an Arab fatherland." Ahmed Shereef Bey, another Young Turk leader, wrote in a similar sense in the great organ of the party, the *Tanin*. This sort of propaganda, inflaming official Turkey against its own subjects, was spread for years after the Young Turks had achieved their easy victory in 1908, in all the provinces of Turkey, and it was this which made the deportations and wholesale massacres of the Christians in Turkey and of the Armenians in particular, of all the non-Moslem or non-Turkish subjects there so cruel and ruthless. Coupled with this was an all-embracing Turanianism. Ahmed Shereef Bey wrote: "If all the Turks in the world were welded into one large community a strong nation would be formed worthy to take an important place among the other nations of the earth." It was this underlying dogma which inspired the Turkish armies in Asia during the brief period of the World War when they were triumphant in the Caucausus and in West Persia to invade the latter and attempt to annex those districts where people of Turanian stock were predominant. The great Russian victory of Sarikamysh, 1917, squelched these dreams in blood. Tekin Alp, another equally influential Young Turkish leader, had this to say: "If the Russian despotism is, as we hope, to be destroyed by the brave German, Austrian and Turkish armies, 30,000,000 to 40,000,000 Turks will receive their independence. With the 10,000,000 Ottoman Turks this will form a nation of 50,000,000, advancing toward a great civilization which may perhaps be compared to that of Germany in that it will have the strength and energy to rise ever higher. In some ways it will be even superior to the degenerate French and English civilizations." To doctrines such as the above, namely, teaching salvation for the decrepit Ottoman people through the help of Panislamism and Panturanianism, had been changed the Liberalism, the "brotherhood of man" ideas that first inspired the Young Turkish movement that triumphed so easily in 1908.

When, therefore, at the beginning of the World War, in the fall of 1914, Turkey was urged by both sets of belligerents to join them, the soil was well prepared for her entry into the war on the side of Germany. For the dominant currents of opinion ran strictly counter both to British, Russian and French interests and aims. Britain was threatened in her Indian rule by the dogma of Panislamism — it might mean the revolt or weaning away of her 60,000,000 Mohammedan subjects if the Central Powers and Turkey should prove victorious; she had, besides, always advocated the equal rights of the non-Turkish populations in the Ottoman Empire. This applied with still greater force to Russia, and French aspirations in Syria would also be frustrated if Panislamism should prevail. On the other hand, no such considerations were apparent in the case of Germany and Austria. Again, the Turkish army was German-trained and partially so officered. This was one of the deciding factors that led to Turkey's siding with Germany in the tremendous struggle, that and the belief that militarily Germany was invincible. There were minor reasons as well tending in the same directions. For economic reasons England, France and Russia had never consented to Turkey's raising her rates of import or export duties. Yet these were, from the Turkish point of view, wholly inadequate and contributed very largely to Turkey's poor finances. The Turks also strongly desired the complete abolition of consular jurisdiction, within Turkish territory, abuses of which they seriously complained of. Much Turkish pride had been roused on the latter point. Turkey likewise found much fault with the state of economic, financial and political tutelage in which, as she averred, the three powers spoken of kept her. They wished,

therefore, to utilize the World War for casting off this "yoke," as it seemed to them. These considerations, all of them strong and likewise all of them coinciding so entirely with the things striven for by the ruling clique, coterie, or whatever one may term it — for just a handful of men, Enver, Talaat, Niazi and Shevket, held Turkey's destiny in the hollow of their palms during the years that Turkey fought Russia and the Western Powers,— vanquished any misgivings which Turkey, especially the more conservative portions of her population, may have had. These considerations, too, stifled the voice and benumbed the conscience of the Turkish government and official circles in regard to the Armenian and Syrian atrocities later on. Classic witnesses for this are two credible and highly respectable Germans who saw all and spoke out. One of them was Dr. Martin Niepage, of the German Technical School at Aleppo, who resigned his charge because the war crippled the school and who addressed a strong letter of protest to the Reichstag in respect of these cruel outrages against Ottoman Christians. Incidentally he passes judgment on the "civilizatory mission" of the Turks, saying: "Of all our pupils in the schools and colleges of Turkey the pure Turks are the most unwilling and the least talented. From my personal experience I can only prophesy that the Turks proper will never achieve anything in trade, industry or science." Another just as competent witness is Dr. Karl Wiedenfeld, professor of political sciences at Halle.

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TURKEY-BUZZARD, the best known and most widely distributed of the American vultures (*Cathartidæ*), its range including the greater part of the United States and the entire South American continent. It is about two and one-half feet long, its wings may extend six feet and it weighs about six pounds. The plumage is blackish brown, the naked head is red and the bill white; the scientific name is *Cathartes aura.* From about the latitude of Philadelphia northward the turkey-buzzard is migratory and visits New England only rarely, but throughout the remainder of its range it is chiefly resident. Like other vultures its principal food is carrion, but insects and small living mammals, reptiles and the young and eggs of birds are also eaten. Especially in the South, where it consorts with the black vulture, this species performs a most valuable service as a scavenger. To a considerable extent gregarious the common attraction is generally the presence of some carcass. Notwithstanding the generally repulsive habits of the turkey-buzzard its powers of flight must claim admiration; seemingly for hours at a time it soars in widening circles, often at a great height, and scans the earth in quest of a meal. The actions of any one bird when food is discovered attract others, and these again others, until many have gathered to the feast, often from great distances. In this manner all of the buzzards over a large area keep in touch with one another and any decomposing carcass is certain to be discovered and removed. Turkey-buzzards nest in pairs or in small communities, building their rude nests on the ground often by the side of a fallen log, or an old rotting tree stub or in a cave among rocks and always in out-of-the-way places in thick woods. The eggs are one or two in number, nearly three inches long and dirty white spotted with various browns and lavender. The nestling birds are thickly covered with white down. The rookeries are often very foul. See VULTURE.

TURKEY-CORN. See SQUIRREL-CORN.

TURKEY ORDERS AND DECORATIONS. See ORDERS, ROYAL.

TURKEY-RED, a color, originally produced on cotton cloth, rivaling the rich red obtained in dyeing wool and more permanent than any other red dye. It is obtained by the use of madder, in conjunction with an intricate and tedious method of dyeing, the three most essential processes of which are the impregnation of the cloth with an oleaginous soap, the mordanting with alumina and the dyeing with madder. The theory of these several processes is little understood and for that reason the long and repetitious method has never been successfully shortened. The art is supposed to have originated in India and from there was introduced into Turkey, where Adrianople was long the seat of the industry. From this fact comes the name Adrianople-red, by which the color is sometimes known. In the middle of the 18th century Great Britain and western Europe began the manufacture of turkey-red fabrics and in portions of France, in Glasgow and in Lancashire the industry has assumed importance. Besides being used in the solid color, turkey-red cloths are used in the manufacture of cloth "prints," the red being bleached from the design wherever it is desired to leave white or impose another color.

TURKEY-STONE, or **TURKEY OIL-STONE,** a very fine-grained silicious rock, highly prized as a honestone. It comes from Asia Minor.

TURKISH BATH, a popular form of hot steam or hot air bath in which the bather after being subjected for some little time to a considerable temperature is vigorously rubbed down, and is then conducted through a series of cooling chambers till he has regained his normal temperature. The secretions and accretions are completely removed from the skin, which is left free to perform its functions.

TURKISH LANGUAGE. It belongs to the linguistic group known as the Ural-Altaic

or Finno-Ugrian. Of the idioms forming part of this group the Turkish holds premier place because of the great size of territory in which it dominates and because of its conformity of type. In structural points it excels within its own domain. Properly speaking, all those dialects spoken as far east and north as the Lena River in Siberia, and all of which are nearly related, may be classed as Turkish. But general usage confines the term to the language of the Ottomans, or Turks proper, with its centre in Anatolia, Asia Minor. The two characteristic peculiarities of the Ural-Altaic family, viz., agglutination and vowel harmony, are found in great strength in the Turkish. The first of these, agglutination, makes possible the automatic formation of conjugations, the root of the verb in all these cases remaining unaltered at the head of the word. Thus, for instance, *sev-mek,* to love, becomes *sev-ish-mek,* to love each other; *sev-ish-dir-mek,* causing to love each other; *sev-ish-dir-il-mek,* causing to have loved each other; *sev-ish-dir-il-me-mek,* not causing to have loved each other, etc. As to the purity of vowel harmony, invariably no soft vowel may be employed in a word the stem of which does not contain it; thus, *pederiniz,* your father, but *dostunouz,* your friend. Suffixes are usually inserted, as *yazdim,* I wrote, *yazmadim,* I did not write. The grammatical forms are abundant, logical and efficient. To give an idea of the amplitude and flexibility of these grammatical forms, it may be mentioned that the mutations of which each Turkish verb is capable have been computed to run up to a score of thousands. Yet withal the rules are so simple and clear that the memorizing of 44 syllables or particles enables the student to construct himself and understand the whole series. Another unique feature is that the Turkish grammar has but one conjugation and no irregular verbs save the few auxiliaries. There is no gender for noun, pronoun or adjective, and the latter is not subject to any change except for comparison. The Turkish syntax is also peculiar, the unit of expression being the paragraph, and there being no punctuation. As a rule the subject of the dominating verb is put at the beginning, or near the beginning, of the paragraph, and all subordinate clauses have their verb in the participial form, and the meaning of the whole phrase being not apparent during the building-up process until the chief verb, somewhere near the end, makes the sense clear.

But while thus the grammatical structure of Turkish is purely and consistently Ural-Altaic, the stock of words in it, notably that used for literary purposes, has been greatly added to from Persian and Arabic, as well as European tongues, while the original number of Turkish words has correspondingly shrunk. Its alphabet Turkish has borrowed from the Arabic, with five new consonants added to the original 28 Arabic. The adoption of the Arabic alphabet, which was done for purely religious reasons, was a grave mistake from the linguistic point of view, as phonetically the Turkish and the Arabian differ very materially from each other, and some of the Turkish sounds cannot be properly reproduced in Arabic at all. One of the five additions is, besides, purely Persian, and another purely Turkish. Like the Arabs and Persians the Turks read from right to left. There is, however, a variety of script signs in use, such as those only employed for *fermans* (or official decrees), for poetry, for letter writing, etc. The most interesting forms of Turkish writing are those used on the inscriptions found in Siberia, near the Yenisei River; these contain historical records, a few of them dating back to the 4th and 5th centuries A.D. Those inscriptions met with north of Lake Baikal, in Mongolia, are also of great archæological importance, recounting as they do the deeds of Bilgä Kagan, and those of Kara Balgassun, dating from about 800 A.D., are also worthy of note. In all these ancient records the alphabets used are of Aramaic derivation, some simple and rune-like in shape, others, of more recent date, more complicated.

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TURKISH LITERATURE. As Islam was the gift of Arabia and Persia to the Turks, so also has their literature been powerfully influenced by these two countries. Nay, the sober truth is that nearly all their higher education dates from there, at least up to the period of the Crimean War, but a few generations ago. As a consequence, there is relatively little of originality in Turkish literature. However, it is customary to subdivide it into three periods: The earliest, when Turkish writers first arose in central Asia and India, and when they employed for the most part Persian as their medium of expression, about 900–1500 A.D.; the middle period, about 1500–1850 A.D., when Arabic was both their model and inspiration in literature, save only in poetry; and the modern period, since the middle of the 19th century, when they turned to the Western nations, preferably the French, for instruction and guidance. It goes without saying that, in a general way, during the two older periods Turkish literature closely resembles that of the chief Oriental writers of those times, both in aims and style and in subject matter, and that being largely imitative it is to a great extent devoid of those strong traits that are found in other, in purely national, literatures. In fact, much of the best literature written by Turks during those 900 years is necessarily swallowed

up by, and forming an integral part of, Persian and Arabic literature, as also it is mostly couched in those two tongues and colored by their idiosyncrasies. The last and shortest period, that of 1850 to the present day, is again too strongly tinctured with the Gallic spirit to be taken as a fair representation of the Turkish mind, although «realism» has been its chief motto,— the realism of Zola usually.

In point of time the earliest literary records of Turkish writing are the well-known inscriptions in central and northeastern Asia, but these have almost solely an archæological, and not a literary, value. Of considerable merit is a genealogical history of the Tatars by Abul Ghazee, from as early as the 12th century, notable mainly for its pristine Turkish. The author of 'Baz Nameh' a lengthy poem descriptive of the delights of falconry, is by one of the best of the 2,200 Turkish poets (among whom there are but seven women) and rhymesters enumerated in a history of Turkish literature by Baron Hammer-Purgstall. Unfortunately the poem is anonymous. Suleiman (d. 1403), author of 'Mewlid-i-Nebi,' a famous lay celebrating the birth of the Prophet and read in mosques these last 500 years with powerful effect, first wrote in a Turkish approximating that of to-day. Shekhi (about 1440), author of the 'Khar Nameh' (Book of Donkeys), introduced the Persian romantic epic with the Turks. Burhan-ed-Deen, a descendant of Genghis Khan, who lost his life in 1398, an adventurer and great warrior, left some poems in Turkish, although closely modeled after the Persian style. Amud-ed-Deen, writing under the pseudonym of Nesimi and a man strongly influenced by Sufeeism, wrote early in the 15th century. But being a freethinker and heretic, he was (in 1417) flayed alive in Aleppo. All his writings breathe, however, a joyous spirit. Ali Sheer, writing under the name of Nevayi (d. 1500), was doubtless a poet of considerable pretensions, who in order to have the necessary leisure for writing resigned early from the lucrative office of Grand Vizier to Sultan Husseïn. His writings show much humor and power of expression. Babr, a scion of Tamerlane, and conqueror of a part of India (in 1525) was also quite a writer, but confined himself to prose. His campaigns he has himself described in rather rude but highly expressive Turkish. Lami is probably the most productive of all Osmanian poets. His fame rests chiefly on his four great epics. He died in 1531. Baki, of obscure origin, is held to be the greatest lyric genius the Turkish race has produced. But while fluent and often flamboyant, his thoughts are nearly altogether borrowed from the Persians, especially from Hafiz. Baki's output was voluminous, but much of it has not survived. A little more mental independence may be ascribed to Fazli, likewise a lyrical poet, who lived and flourished during the reign of Soliman the Great and died in 1563. His fine allegorical poem, 'Gül u Bülbül' (Rose and Nightingale), has been translated into several languages, and is in part quite modern in its train of thought. Even greater originality is shown by Mesehi (d. 1512), whose love sonnets addressed to the boy beauties of his town, both in metre and in diction, are elegant productions. Rewami (d. 1523) cultivated as his specialty dithyrambic poems celebrating the festivals, banquets and great processions of his day. Sa'ad-ed-Deen, perhaps the best-known poet of his day, died in 1599, when Arabic influences began to permeate Turkish literature. His life was a very active one, his career beginning as a great chieftain and ending as Sheikh ül Islam, in the reign of Mohammed III. His great work was named 'Taj-et-Tevarikh,' a laudatory history of the Turkish Empire and its conquests, but its chief blemish is its superabundance of foreign vocables. The greatest poets of the 17th century were Nefi (d. 1635) and Nabi (d. 1712). The latter's *ghazels* are among the finest of this distinctly Oriental form of poetry. Nabi's real name was Yousouf, and he resided in Urfa, the recipient of a modest pension from the sultan. One of his longer poems, the 'Kairiyeh,' has been done into French. Kiami, whose real name was Abu Bekr, and who died in 1791, was a successful imitator of the earlier Turkish poets. In historical works Turkish literature is very rich. But the common defect of all Oriental historical writings, exaggeration and strong partisanship, clings to them, of course. Among them all may be mentioned Katib Tshelebi (Hadja Khalfah), who died in 1658, leaving behind him a great mass of valuable manuscript writings, mainly historical and geographical. Rashid (1660–1721), Naima Efendi (1591–1659), Sami, Shakir and Sübhi (all three about 1730), Izzi, Wassif (1750–70), Enveri, Dshefdet (1774–1825), Assim (1787–1808), Lutfi (from 1830 on), are some names of note. The works of these writers are very voluminous, but nearly all, except in details, utterly unreliable. Some monographs, however, are important, such as that by Kemal Pasha Sa'adi, who as a contemporary and actor described the events preceding and the campaign ending in the memorable battle of Mohacz (1526). Of geographical works, mainly fancifully descriptive, some have been translated by Hammer-Purgstall into English (London 1834). Another chapter of Turkish literature, as yet very inadequately gone into and promising rich treasure, is that comprising anonymous collections of popular tales, buffooneries, etc., such as the 'History of the Forty Viziers,' a cycle of stories rich in racy humor and wit, although rather frequently obscene; the 'Life of Nasr-ed-Deen Hodja,' a collection of similar scope, said to have emanated from some unknown Turk of Anatolia; 'Siret-i-Sejjid Battâl,' a sort of Don Quixote; the 'Shah Miran,' a collection of Turkish fairy tales, etc. Since the Crimean War a movement set in, partly political, partly literary in its nature and best known as the Young Turkish. There had been before that an enormous number of Turkish works translated from European languages, mostly French. After 1850 this tendency increased greatly. But hand in hand with it went a rebirth, or a new adaptation of Turkish to modern thought. Ibrahim Shinassi was its first leader, and Mohammed Emin its most eloquent interpreter, his poems being striking, ringing true and full of power and elemental passion. Among the band of «realists» and «purists» initiated by the latter deserve mention: Amed Vefik Pasha, author of a dictionary (d. 1893); Ahmed Midhat Efendi, novels, essays (d. 1905); Kemal Pasha (d. 1878); Jevdet Pasha, the his-

torian, Zia Pasha, the poet and essayist, Ebuzzia Tewfik, the critic and writer.

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TURKISH SPY, The. Giovanni Paolo Marana (1642–93) was a Genoese political refugee gifted with a keen mind, cosmopolitan political interests and a facile pen. Finding himself in financial straits, he began in Paris in 1684 the publication of 'L'espion du Grand Seigneur dans les cours des princes chrétiens,' a series of little volumes of letters addressed by "Mahmut the Arabian" to officials and friends in Turkey. This scheme, then novel, gave opportunity for relatively free comment on Continental politics in the days of Cardinal Mazarin and the young Louis XIV and of French society and manners in the hey-day of Versailles. The idea was keenly relished. Three other volumes had followed by 1688, afterward increased by other hands to nine in the edition of 1756. The substance of these four volumes forms the first volume (1687) of an English version afterward extended to eight with this descriptive title page: "The eight volumes of Letters writ by a Turkish Spy who lived 45 years undiscovered at Paris giving an impartial account to the divan at Constantinople of the most remarkable transactions of Europe and discovering several intrigues and secrets of the Christian courts, especially that of France, from the year 1637 to the year 1682, written originally in Arabic, translated into Italian and from thence into English and now published with a large historical preface and index to illustrate the whole." The translation was apparently by William Bradshaw, revised by Robert Midgley. It passed through at least 25 editions. The volumes from the second onward appeared first in English. Whether they were translated from a French manuscript, possibly Marana's, is uncertain. The opportunity for political satire contained in Marana's idea delighted Swift, who commends it in the 'Journal to Stella.' It was often imitated in England and notably in France in the 'Persian Letters' of Montesquieu. Consult 'Dictionary of National Biography' (Vol. XXXVII, 366, 367), Art. "Midgley."

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TURKOMANS, tėr'kō-mąnz, a group of nomadic Tatar tribes occupying the regions to the east and south of the Caspian Sea. Other related tribes, known as the western Turkomans, are settled further to the west and south, in Syria and Asia Minor. See TURKESTAN.

TURMERIC, the tuberous rhizomes of a plant (*Curcuma longa*) of the ginger family. It is a perennial, native to southern Asia, and cultivated largely both there and in the Malayan Islands. The ovate, central tubers are known as "bulbs," or "round turmeric"; the more cylindrical, lateral ones, as "fingers" or "long turmeric." They are all hard and tough, brownish or yellowish-green outside and orange-hued, resinous and aromatic internally. The aromatic taste and odor are due to an oil called turmerol or turmeric-oil. Turmeric, ground into a powder, has been valued for centuries in Asia, and especially in India, as a carminative and aromatic-stimulant drug, an infusion of it in milk being a common remedy for colds; it is also applied externally as a cooling lotion for diseases of the skin and eyes. Its chief utility in India, however, is as a condiment and dye, it being the important yellow ingredient of curries and curry-powder, and yielding a beautiful, but fugacious yellow dye. White paper soaked with a tincture of turmeric changes to a reddish-brown color, drying out to violet when an alkali is added to it, so that a test-paper for alkalies is prepared from it called turmeric or curcuma paper. The plant itself has long, narrow sheathing leaves on the flower-stalk, which end in a leafy spike of yellow flowers. A species of *Canna*, cultivated in Sierra Leone, is the African turmeric, used by the natives there as a dye-plant. Bloodroot (*Sanguinaria canadensis*) and the yellowroot (*Hydrastis canadensis*) are also called turmeric and turmeric-root. The turmeric-tree is *Acronychia baueri*, of southeastern Australia, the bright-yellow inner bark of which yields a dye.

TURNBULL, Robert James, American publicist: b. New Smyrna, Fla., Jan. 1775; d. Charleston, S. C., 16 June 1833. He was educated in England, was admitted to the bar in 1794 and began practice in Charleston. In 1810 he retired to his estate and became active in the Nullification movement. He was a member of the free trade convention (1831–32), was a delegate to the South Carolina convention that passed the Nullification ordinance (1832) and joined the volunteers to oppose the constitutional government. His pamphlets written under the pseudonym of "Brutus" were collected and published in 1830.

TURNBULL, William, American engineer: b. Philadelphia, Pa., 9 Oct. 1800; d. Wilmington, N. C., 9 Dec. 1857. He was graduated at the West Point Military Academy in 1819 and entered the army as lieutenant of artillery. He was made assistant topographical engineer with the brevet of captain in 1832, and in 1843 was superintending topographical engineer on the Potomac aqueduct. He was made major in 1838, had charge of repairs to the Potomac long bridge (1841–43) and later was in charge of harbor improvement on the Great Lakes. He was brevetted colonel for services during the war with Mexico, and was afterward engaged in a variety of difficult engineering projects.

TURNER, tėr'nėr, **Charles Tennyson,** English poet: brother of Alfred Tennyson. See TENNYSON-TURNER, CHARLES.

TURNER, Charles Yardley, American artist: b. Baltimore, Md., 25 Nov. 1850; d. New York, 31 Dec. 1918. He studied in Paris with Laurens, Munkacsy and Bonnat. Was elected to the National Academy of Design; was member of the American Water Color Society, the American Etchers and the National Society of Mural Painters. Mr. Turner excelled as a mural painter. One of his pictures is in the courthouse at Baltimore and shows the burning of the steamboat *Peggy Stewart.* Other paintings are in New York galleries and elsewhere. Among his works familiar to many are the decorations in the rotunda of the Manhattan Hotel, New York. In the Metropolitan Museum is his 'Bridal Procession' and in the Union League Club, Chicago, is 'John Alden's Letter.' 'A Dordrecht Milkmaid,' in the Water Color Society exhibit in 1892, attracted much favorable attention, and then came perhaps the most noted of his canvases, 'Days That Are No More,' picturing a widow and a child on the stile of a churchyard. At the Buffalo Pan-American Exposition (1901) Mr. Turner was director of color; he was assistant director of decoration at the World's Columbian Exposition, Chicago, in 1893. In 1912 he became director of the Maryland Institute Schools of Art and Design at Baltimore.

TURNER, Ethel, pen name of MRS. H. R. CURLEWIS (q.v.).

TURNER, Fred, Australian botanist: b. Pontefract, England, 1856 He went to Australia in 1874, where he joined the staff of the Government Gardens at Brisbane and remained for five years, when he became botanist to the Department of Agriculture of New South Wales, and consulting botanist to the West Australian government. He traveled over 60,000 miles throughout Australia botanizing; made the study of botany popular in Australia and wrote interestingly on the subject for the press. He is the author of numerous works, many of which have been published by the government; translated into numerous foreign languages and republished at the expense of foreign governments. He is the holder of many medals and diplomas for economic botany. For several years he was engaged in the botanical survey of New South Wales. Among his published works are 'Grasses of New South Wales' (1890); 'Indigenous Forage Plants of Australia' (1891); 'Australian Grasses' (1895); 'West Australian Grasses' (1896); 'West Australian Salt Bushes' (1897); 'Suspected Poison Plants of New South Wales' (1890–1914); 'Noxious Exotic Weeds' (1890–1913); 'New Commercial Crops for New South Wales' (1890–1914).

TURNER, Frederick Jackson, American historian: b. Portage, Wis., 14 Nov. 1861. He was educated at the University of Wisconsin and took his Ph.D. degree at Johns Hopkins (1890), becoming professor of American history in the University of Wisconsin (1892–1910) and professor of history in Harvard the latter year. He was president of the American Historical Association (1910–11) and associate in the department of historical research of the Carnegie Institute (1916–17). He is author of 'Rise of the New West' (1906); 'Reuben Gold Thwaites' (1914), etc.

TURNER, Henry McNeal, American bishop of the African Methodist Episcopal Church: b. Newberry Court House, S. C., 1 Feb. 1834; d. 8 May 1915. He educated himself by dint of earnest perseverance and was licensed to preach by the Methodist Church South in 1853. In 1858 he transferred his membership to the African Methodist Church and studied for the classics, Hebrew and divinity at Trinity College. He was the first colored chaplain ever commissioned, and after being mustered out in 1868 was then commissioned chaplain of the regular army. He sat in the Georgia legislature in 1868 and 1870, and in 1880 became a bishop in his Church. He organized four annual conferences in Africa, was a prominent advocate of the return of his race to Africa and published 'Methodist Polity,' etc.

TURNER, Joseph Mallord William, English painter: b. London, 23 April 1775; d. Chelsea, 19 Dec. 1851. He entered the Royal Academy as a student, and after remaining there in that capacity for five years and working actively at his profession for another five, during which periods he sent to the exhibition no less than 59 pictures, he was elected in 1799 an associate of the Royal Academy. In the two following years he exhibited 14 pictures, and in 1802 was elected an academician. Until this date he had chiefly been known as a landscape painter in water-colors, but thenceforth he turned his attention to oil-painting, and in the ensuing half century produced at the Academy exhibitions upward of 200 pictures. In 1807 he was elected professor of perspective in the Royal Academy, and the following year appeared his 'Liber Studiorum' or 'Book of Studies,' which Charles Turner, Lupton and others engraved. Other works by him which were engraved are his illustrations of Lord Byron's and Sir Walter Scott's poems; Rogers' 'Italy' and 'Poems'; 'The Rivers of England'; 'The Rivers of France' and 'Scenery of the Southern Coast.' To enumerate the different paintings of Turner would be impossible. They have established him as the greatest of English landscape painters and earned for him the appellation of the "English Claude"; indeed many of his admirers pronounce him superior to the great French painter of that name. Among his more famous pictures reference may specially be made to his 'Kilchurn Castle'; 'Loch Awe'; 'The Tenth Plague of Egypt'; 'The Wreck of the Minotaur'; 'Calais Pier'; 'The Fighting Téméraire Tugged to her Last Berth'; 'The Grand Canal, Venice'; 'Dido and Æneas'; 'The Golden Bough'; 'Modern Italy'; 'The Fall of Carthage'; and 'The Building of Carthage.' In private life Turner was a man rather of reserved and unsocial manners, but the reports circulated of his parsimony and sullenness appear to have been quite untrue, and many instances are recorded of his liberal and generous acts both as a man and an artist. He never was married. By his will he bequeathed all his pictures, of which he had about 60 in his possession at his death, along with an immense number of engravings and sketches, to the na-

tion, on condition of a suitable building being erected within 10 years for their reception. They have been placed in the Turner Gallery, occupying two rooms in the National Gallery. He also intended a large part of his fortune to be devoted to the formation of a benevolent fund for artists, but this intention, though clearly enough expressed, was set aside by the lawyers because of the somewhat confused nature of his will. Turner owes his immense reputation largely to the brilliant advocacy of John Ruskin (q.v.) in his 'Modern Painters.' Mr. Ruskin divides his career, from an artistic point of view, into five periods: a period of development, three periods of greatness and one of decline. His development period ended with 1800. It includes these, among other works: 'A View of the Archbishop's Palace at Lambeth' (1790); 'The Pantheon the Morning after the Fire' (1792). His first style lasted from about the beginning of the century to about 1820, and in it he "labored as a student imitating various old masters." The principal pictures of this period are 'The Fifth Plague of Egypt' (1800); 'The Tenth Plague of Egypt' (1802); 'Kilchurn Castle' (1802); 'Calais Pier' (1803); 'The Shipwreck' (1805); and 'Dido building Carthage' (1815). The 'Liber Studiorum' also belongs to the period of his first style. His second style prevailed, according to Ruskin, from about 1820 to about 1835, and was characterized by freedom from mere imitation and by striving for beautiful, ideal effects. Among the works which illustrate it are the following: 'The Bay of Baiæ,' with 'Apollo and the Sibyl' (1823); 'Cologne' (1826); 'Dido directing the Equipment of the Fleet' (1828); and 'Ulysses deriding Polyphemus' (1829). During his third period, 1835–45, he produced many splendid works of marked individuality, but shallow critics began to ridicule him and his work, and full appreciation of his genius did not come until Ruskin entered the lists in 1843. The following represents his third style: 'Mercury and Argus' (1836); 'Snowstorm, Avalanche, and Inundation' (1837); 'Modern Italy' (1838); 'Ancient Italy' (1838); 'The Fighting Téméraire Tugged to her Last Berth' (1839), his best known picture; 'The Campo Santo' (1842); 'The Snowstorm' (1842); 'Peace — Burial at Sea' (1842); 'The Approach to Venice' (1843); and 'Rain, Steam and Speed' (1844). The remaining years of his life were years of decline, but his genius still asserted itself fitfully. The Metropolitan Museum and the New York Public Library have several good examples of the work of this artist. Consult Ruskin, 'Modern Painters,' biographies by Thornbury (New York 1862); Hamerton (Boston 1879); Monkhouse (New York 1882); Armstrong, Sir W., 'J. W. Turner' (New York 1901); Wornum, 'Turner Gallery' (1859); Wedmore, 'Turner and Ruskin' (2 vols., London 1900); Cook's Handbook to the National Gallery; Rawlinson, W. G., 'Turner's Liber Studiorum: Description and Catalogue' (2d ed., New York 1907); Finbery, A. J., 'Turner's Sketches and Drawings' (ib. 1910); Phythian, J. E., 'Turner' (ib. 1911); Wyllie, W. L., 'J. M. W. Turner' (ib. 1905). See also the article PAINTING for an indication of his position in the history of painting.

TURNER, Nat, negro slave, preacher and leader of the "Southampton Insurrection"; b. Southampton County, Va., 1800; executed at Jerusalem, Va., 11 Nov. 1831. A man of elementary education, but a preacher of natural ability and influence among the negroes, his mystical claims of hearing voices and seeing visions from childhood culminated in 1828 when he announced that a voice from heaven had declared that "the last shall be first"; that the negroes should rise and slay their enemies and gain freedom and control, when a sign should appear. The solar eclipse of February 1831 and subsequent unusual atmospheric conditions were accepted as the signal, and on Sunday night, 21 Aug. 1831, Turner and seven companions murdered his master and five members of the family in their beds. With their band increased to 53 members, the negroes massacred 24 children, 18 women and 13 men of white blood before noon of the following day, when they were dispersed by a party of white men who had hastily gathered for defense. The criminals were subsequently hunted down and Turner escaped capture until 30 October. Tried and condemned, 17 of the band, including Turner, were hanged. The remainder received other sentences, as evidence showed that they acted under life or death compulsion. In other instances, at the risk of their lives, faithful slaves successfully defended their masters and families from slaughter. Pro-slavery advocates irrationally attributed the insurrection to the work of the abolitionists. Stricter slave codes were enacted, and the liberation movement received a serious setback. Consult Drewry, W. L., 'The Southampton Insurrection' (Washington 1900).

TURNER, Ross Sterling, American artist: b. Westport, Essex County, N. Y., 29 June 1847; d. 12 Feb. 1915. He adopted the profession of an artist in 1873 and studied in Germany and Italy. Among his notable pictures are 'A Small Court, Mexico'; 'El Jardin Modesto'; and 'A Bermuda Wedding.' He is the writer of 'Water Colors'; 'Art for the Eye — School Room Decorations', etc.

TURNER, Sharon, English historian: b. London, 24 Sept. 1768; d. there, 13 Feb. 1847. After a successful career as a London attorney he retired from practice in 1829 and devoted himself to literary pursuits. He is best known by his 'History of the Anglo-Saxons' (1799–1805; 7th ed., 1852), long a standard authority. His other works include 'History of England during the Middle Ages' (1814–23; 7th ed., 1853); 'Modern History of England,' comprising 'The Reign of Henry VIII' (1826); and 'The Reigns of Edward VI, Mary and Elizabeth' (1829); 'Sacred History of the World as Displayed in Creation and Subsequent Events to the Deluge' (1832; 8th ed., 1848), etc.

TURNER, Thomas, American naval officer: b. Washington, D. C., 23 Dec. 1808; d. Glen Mills, Pa., 24 March 1883. He entered the navy in 1825, served on the *Columbia*, flagship of the East India squadron, in 1838–41, and participated in the destruction of the Malay pirate towns, Mucke and Quallat Rattoo, Sumatra, in 1839. He was commander of the *Fredonia* in the Gulf squadron in 1847, commanded the

Reefer in the assault upon Tuspan in April 1847, and in 1855 was promoted commander. In 1858–60 he was in command of the *Saratoga* in the Home squadron, and in the latter year captured the ships *Miramon* and *Marquis de Habana,* which were being used by the Mexican revolutionary party to blockade the port of Vera Cruz. At the outbreak of the Civil War he was assigned to command *New Ironsides* in the South Atlantic squadron, was promoted commodore in 1862 and took an important part in the assaults on the forts of Charleston, S. C., in 1863. He became rear-admiral in 1868, commanded the Pacific squadron in 1868–70, and in the year last named was retired, after 45 years of active service.

TURNER, Sir William, English anatomist: b. Lancaster, 1832; d. 1916. He received his general education in private schools and began the study of medicine in Saint Bartholomew's Hospital, graduating with distinction in the University of London in 1857. He became a member of the Royal College of Surgeons in 1853 and in the following year was appointed demonstrator in anatomy in the University of Edinburgh. In 1867 he succeeded John Goodsir as professor of anatomy. This post he resigned in 1903, when he was elected principal of the university. After 1873 he represented his university on the General Medical Council, of which he became president in 1898. In 1886 he was knighted. He presided over the meeting of the British Association at Bradford in 1900 and delivered an address on the progress of the cell-theory in biology. He examined in anatomy on behalf of the universities of Oxford, London and Durham, and lectured before the Royal College of Surgeons. He was one of the founders, and from 1866 to 1894 was joint editor of the *Journal of Anatomy and Physiology,* and contributed many papers to the transactions of learned societies. He published 'An Introduction to Human Anatomy' (1875); 'Lectures on the Comparative Anatomy of the Placenta' (1876); and an 'Atlas of Human Anatomy and Physiology.'

TURNER, William Wadden, American philologist: b. London, England, 23 Oct. 1810; d. Washington, D. C., 29 Nov. 1859. In 1818 he came to New York, was given a public school education and became a printer. At 26 he was a master of modern languages and Hebrew, and later secured a knowledge of Arabic, Sanskrit and other Asiatic tongues. He printed a number of works. In 1842 he was elected professor of Oriental literature in Union Theological Seminary and held the position until 1852, when called to the library of the patent office in Washington.

TURNER PRINTS. See Engravings.

TURNER FALLS, Mass., village in Franklin County, on the Connecticut River, and on the New York, New Haven and Hartford and the Boston and Maine (Fitchburg) railroads, about 35 miles north of Springfield and three miles northeast of Greenfield, the county-seat. The village is in an agricultural section and has considerable manufacturing interests. The long bend here in the river is cut off by a canal three miles long, which, with three falls, furnish extensive water power. The chief manufactures are cutlery, paper, leather, foundry and machine-shop products and cotton goods. The village has a high school, public and parish schools and a public library. Turner Falls is the largest village in the town of Montague (q.v.). Pop. (included in that of the town) about 6,866.

TURNER'S GAP, Battle of. See South Mountain, Battles of.

TURNER'S REBELLION. See United States, Wars of the; Nat Turner's Rebellion.

TURNEY, tėr'nĭ, **Peter,** American jurist, son of Hopkins Lacey Turney: b. Jasper, Tenn., 22 Sept. 1827; d. Winchester, Ky., 19 Oct. 1903. He was admitted to the bar in 1848, practised law at Winchester until the secession of the Southern States, which he actively promoted, and then entered the Confederate army, in which he served throughout the war. He resumed his practice at Winchester after the war, was a justice of the Supreme Court of the State in 1870–86, chief justice in 1886–93, and in 1893–97 served as governor.

TURNIP, a popular name for two closely related biennial herbs of the family *Brassicaceæ.* The common turnip (*Brassica rapa*) has a flattened white-fleshed, tuberous root crowned by a compact tuft of thin green hairy leaves from the centre of which, during the second season, a flower-stem rises about 18 inches and bears numerous yellow flowers. The Swedish turnip, rutabaga or baga (*B. campestris*), has a more globular yellow-fleshed root with a more or less distinct leafy neck and glaucous bluish hairless cabbage-like leaves. The flowers are also yellow. The former has also a tap-root with few fibres; the latter has a large number of fibrous roots not only from the main tap-root but from the base of the tuberous part. Neither of these species is definitely known in the wild state, but they are supposed to be natives of eastern Europe or adjacent parts of Asia. They have been cultivated for centuries as food for man and beast, the common turnip for early use in spring and autumn and the rutabaga more as a winter vegetable or stock food. In many places they have run wild and are occasionally known as charlock. When wild they soon lose the tuberous root.

Except in season of sowing, the cultivation of both species is similar. The common turnip is a quick-growing plant which is usually sown as soon as the soil can be worked in the spring or during midsummer. The first sowing produces roots for late spring and early summer use; the last, for autumn consumption. The rutabaga is generally grown as a full season crop, the seed being sown in late spring. It is much richer in flavor than the common turnip. Like other root crops both these plants succeed best upon deep, rich, well-drained light loamy soils free from stones and other obstructions. The seed is sown in drills about 18 inches apart and the plants thinned to stand about eight inches asunder. The late crop is often sown broadcast, particularly where beef cattle are kept, since the animals may be turned upon the field to browse after the larger roots have been gathered for storing or sale. For success in such practice, however, the supply of moisture in the ground must be abundant,

and the soil must be in the highest possible state of tilth before the sowing of the seed because no cultivation can be given during the growing season. When sown in drills clean cultivation must be given until the leaves meet between the rows and completely shade the ground. Under favorable conditions and good cultivation the yield has exceeded 1,000 bushels to the acre, but under ordinary management half this amount is nearer the average. The early crop is often sold in bunches; the late, by measure. The only insects that are occasionally troublesome are the maggot and the flea-beetle. The former may be avoided by judicious rotation, turnips never being planted oftener than once in three years upon land which has been occupied by a cruciferous crop. The flea-beetles may be repelled by tobacco dust, Bordeaux mixture, etc.

TURNPIKE, a gate that is set across a road and is watched by a person appointed for the purpose in order to stop carriages, carts, wagons, etc., and sometimes travelers, till toll is paid, for the cost and upkeep of the road. Such roads are called turnpike-roads, or simply turnpikes, and formerly were very numerous in Great Britain, but latterly tolls on roads have been almost entirely abolished. See ROADS AND HIGHWAYS.

TURNPIKE GERANIUM. See GOOSEFOOT.

TURNSPIT, a small dog, somewhat like a dachshund, used in old times, in the kitchens of great houses, to turn the spits or jacks upon which meat was roasted before an open fire, the dog traveling in a small treadmill geared to the spit. The breed is now practically extinct.

TURNSTONE. See BRANT-BIRD.

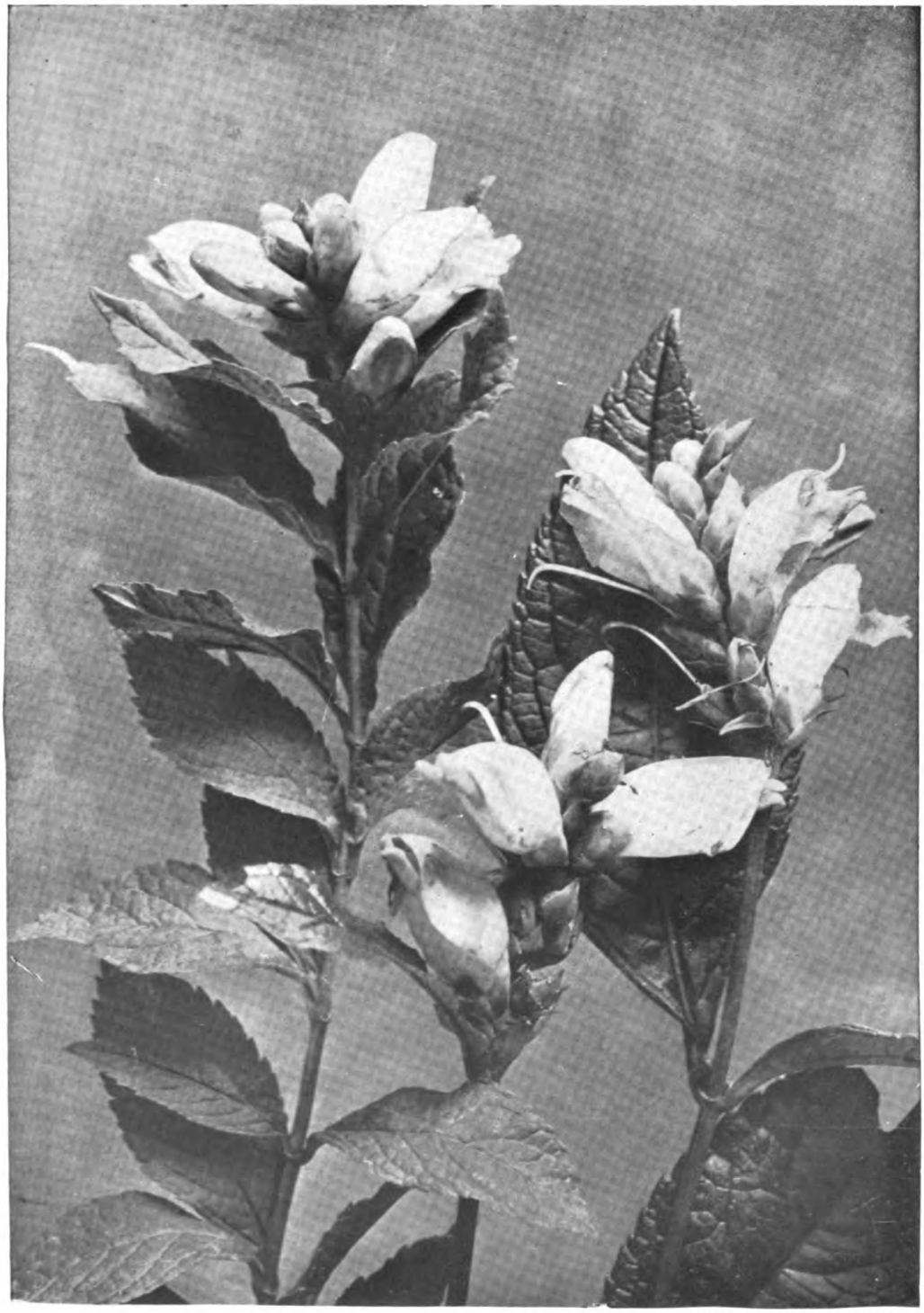
TURPENTINE, a resinous juice, oleoresin, extracted from several trees belonging to the genus *Pinus*. The common American turpentine of commerce comes from the *Pinus palustris*, which grows abundantly in the Southern States. When first extracted it is crude or common turpentine, varying from 75 to 90 per cent of resin and 25 to 10 per cent of oil. Crude turpentines are named from the trees or the territory from which they are taken, as Aleppo turpentine, from the Aleppo pine; American turpentine, from *Pinus palustris;* Bordeau turpentine, from the seaside pine (*P. pinater*); Canadian turpentine, from the balsam-fir; Carpathia turpentine, from the Swiss pine; Hungarian turpentine, from the Mugho pine; also white turpentine, from the long-leaved Carolina pine. The Pistacia tree also yields an excellent turpentine and is sometimes called the turpentine tree, or terebinth. This is believed to have been the original source, the trees being plentiful in the island of Chios. To obtain the oil of turpentine the juice is distilled, usually with water. (See TURPENTINE OIL). Oil or spirit of turpentine, often called simply turpentine, and also "turps," is colorless and is employed extensively in medicine, both internally and externally, and it is also widely used in the preparation of paints and varnishes.

The Box Method.— Prior to 1901, turpentine gathering, as conducted in the United States, was needlessly destructive of the forests and needlessly wasteful of the product. The method, under the box system universally employed, was to chop into the base of the tree itself a cup-like cavity, the sole purpose of which was to receive the resin which flowed from a scarified face of the trunk above it. The box itself does not add to the flow of turpentine; on the contrary, experiment has proved that it diminishes the flow. It is an unnecessary wound driven into the body of the tree at its most vital spot, both weakening its vigor and lessening its power to support the strain of the wind. At the same time it opens the trunk to disease and provides a storehouse of combustibles against the coming of the forest's great enemy — fire. A forest which has been heavily turpentined by this method has before it only decay and death. Until recently the destructive methods in use have been regarded with entire indifference in the regions affected. This has been due to the low valuation of timber throughout the turpentine belt and to the popular belief that the pine forests of the Southern States were inexhaustible.

The Cup System.— In 1901 Dr. Charles H. Herty, of the Bureau of Forestry, after numerous experiments, discovered a new way of extracting turpentine by using earthen pails or cups, not unlike the method of obtaining maple sap. The discovery has resulted in a complete change of methods by turpentine operators all over the South. In a bulletin published in 1902 by the Bureau of Forestry, the claim was made that the experiments with the new cup and gutter system of turpentining had resulted in an increase over the old boxing system of 23 per cent in the amount of the product extracted. This figure was raised in 1903 to more than 36 per cent. The economic saving of this new discovery is enormous. It not only causes a great increase in the amount of turpentine produced, but it is a most important factor in saving the pine forests of the South. Trees from which turpentine has been extracted by the old method soon die from the wounds inflicted on them. The cup and gutter system, on the other hand, is not fatal to the life of the tree and does very little damage to the timber.

The experiments during 1903 have abundantly justified the claim made that the box is an "unnecessary wound," for the cup system has proved efficient in the hands of the regular turpentine labor, while the increased profits under this improved system are sufficient to warrant its adoption by any turpentine operator, regardless of all questions connected with the future of the naval-stores industry. Recent experiments in the distillation of wood have demonstrated that a vast amount of turpentine may yet be obtained from the fallen pines of the South, which are preserved by their content of resin and turpentine. This product is sometimes called artificial turpentine. For statistics and other information concerning the turpentine industry see the article NAVAL STORES. See also ROSIN.

TURPENTINE OIL, the volatile oil or spirit obtained by distilling crude turpentine, the latter being obtained from coniferous trees by incision through the bark or wood. When crude turpentine is distilled there results resin, a solid, and the oil of turpentine, a liquid, which when pure is clear and colorless. It consists chiefly of an essential hydrocarbon oil ($C_{10}H_{16}$),



Photograph by J. Horace McFarland Co.

CHELONE (TURTLE-HEAD)

and the resin, colophony. It is possessed of a penetrating, peculiar odor and a pungent, bitter taste. The various oils display marked diversities in physical properties according to their sources. They are insoluble in water, slightly soluble in aqueous alcohol and miscible in all proportions with absolute alcohol, ether and carbon disulphide. They are solvents for iodine, sulphur, phosphorus, resins and fixed oils. The two principal varieties are derived from the sap of the *Pinus maritima*, or the French maritime pine, and from the long-leafed pine of the Southern States of the United States. The former has a specific gravity of 0.864, boils at 161° and turns the plane of polarization to the left; the latter has the same specific gravity and boiling point, but turns the plane of polarization to the right. Both oils absorb oxygen from the air and acquire powerful oxidizing properties for the probable formation of an organic peroxide ($C_{10}H_{14}O_4$). Turpentine absorbs chlorine with such energy as sometimes to set it on fire. Turpentine oil is of great importance in the arts, and is especially employed for giving consistency to oil paints and varnishes, conferring on them drying properties. In pharmacy, in small doses it is absorbed and acts as a stimulant, antispasmodic and astringent. It produces diuresis, and communicates to the urine passed a smell like that of violets. It can arrest hemorrhage in the capillary vessels. It is generally administered as an enema to destroy tænis, ascarides, etc., in the intestines. Applied externally, it is a powerful rubefacient. Chian turpentine, the product of the terebinth tree, has latterly been successfully employed in cancer.

TURPENTINE VINE. See PISTACHIA.

TURPIN, tėr'pĭn (Fr. tür-păn), or **TYLPINUS,** French prelate: d. 2 Sept. 800. He was archbishop of Rheims and reputed author of a Latin narrative of Charlemagne's wars against the Saracens. There are indications that the work was written in the 12th century, perhaps by Pope Calixtus II. There are editions by Ciampi (1822) and Reiffenberg (1836). Consult Paris, 'De Pseudo-Turpino' (1865); id., 'Histoire poétique de Charlemagne' (ed. by Paul Meyer, Paris 1905); Potthast, August, 'Bibliotheca Historica Medii Ævi' (Vol. II, Berlin 1896).

TURPIN, Richard (known as "DICK TURPIN"), English highwayman: b. Hempstead, Essex. He began life as a butcher's apprentice, was detected in cattle-stealing, fled and joined a band of thieves, with whom he engaged in various acts of depredation and brutal crime. He was captured at York and hanged for murder. His lawless daring made his name a byword, but he has also been decked in the colors of heroism through the ascription to him of generous qualities which there is no evidence to show that he possessed. He is the hero of Harrison Ainsworth's 'Rockwood' (1834).

TURQUOIS, tėr-koiz', a mineral whose name (often spelled "turquoise") alludes to its coming into the European market through Turkey. It is a hydrous phosphate of aluminum, containing a small amount of copper, to which its color is due. It has been a favorite gem in the Orient, from the earliest times, appearing in Egyptian jewelry of extreme antiquity. Turquois does not crystallize, but forms little veins and nodules in a trachytic igneous rock. Its hardness is 6, its specific gravity from 2.6 to 2.8, lustre somewhat waxy and its color varies from dull green to beautiful pale blue. In modern jewelry, only the fine "robin's-egg" blue stones are prized; these occasionally turn green because of the gradual drying out of the water which they contain; heating or exposure to the weather always produces this change. The chief turquois mines, near Nishapur, in Persia, have been worked for many centuries; it has also come from the Sinaitic peninsula, which was probably the ancient Egyptian source. The Persian yield has been failing recently, under crude and primitive methods of working; but a number of American localities have been discovered which are now furnishing a large part of the world's supply. All these mines were formerly worked by Indian or Aztec peoples, some of them very extensively, though only with fire and stone tools, which latter are always present. In some cases, traditions still linger among the Indians, and the stone is held sacred to Montezuma and his people. It figures largely in the Spanish records of the conquest of Mexico, and was in part the highly prized "chalchihuitl" of the Mexicans; though in central and southern Mexico this stone was not turquois but green jade. The chief locality is near Los Cerillos, New Mexico; it is also mined at several other points in New Mexico, Arizona, Nevada and California. A substance often used in place of true turquois is the so-called bone-turquois or ondontolite, which is fossil bone colored blue by phosphate of iron. It is easily distinguished under the microscope by its structure, and by its not yielding a blue color with hydrochloric acid and ammonia. Turquois in the natural rock has recently been very extensively cut into gem stone and sold under the name of "turquois matrix." Consult Pogue, J. E., 'The Turquoise; Its History, Mineralogy, Geology, etc.' (206 pages plates Memoirs National Academy of Science, Vol. XII, pt. 2).

TURRET, *in architecture,* a kind of small tower. Turrets are chiefly of two kinds, such as rise immediately from the ground, as staircase turrets, and such as are formed on the upper part of a building by being carried up higher than the rest. In modern naval architecture, the term is given to a revolving tower usually of armor plate in or on top of which the ship's guns are mounted.

TURTLE CREEK, Pa., borough in Allegheny County, on the Pennsylvania and the Union railroads, 12 miles southeast of Pittsburgh. It has a Carnegie library and a large technical school, and the Westinghouse Electric and Manufacturing Company has a big plant there. Pop. about 5,000.

TURTLE-DOVE. See DOVE.

TURTLE-HEAD. The popular name given to *Chelone barbata* and *Chelone campanulata* plants of the natural order *Scrophulariaceæ* now classed with the Pentstemons (q.v.). They are distinguished by leaves of a leather-turtle appearance whence the designation.

TURTLE TRIBE. See UNAMI.

TURTLES, TORTOISES and **TERRAPINS,** members of the reptilian order *Testudinata* or *Chelonia* (q.v.). To all of the marine and some of the fresh-water species, especially those of large size, the name "turtle" is applied; most of the smaller pond and marsh dwellers are "water-tortoises," a few being designated as "terrapins," while the terrestrial ones, whatever their size, are properly "land-tortoises." About 300 living species, most of them inhabitants of fresh waters, have been described, but the group has steadily declined since Eocene times, and many ancient families are entirely unrepresented in the modern fauna. Tortoises are especially numerous in warm climates, and none extend into the Arctic regions. The marine forms are pelagic and wide-ranging. The various members of this group exhibit considerable diversity in habits and structure, and have been arranged (see CHELONIA) in four sub-orders and numerous families, of which three sub-orders and seven families are represented in the North American fauna.

Of the sub-order *Athecæ* and family *Dermatochelydidæ* the huge leather-turtle (q.v.), the largest of all modern turtles, occasionally appears on our coast. The *Trionycholidea* with the single family *Trionychidæ,* or soft-shelled turtles, are found in the fresh waters of Africa, Asia and North America. They have the plastron and carapace incomplete and covered by a leathery skin; the neck is very long and flexible, and though folding vertically cannot be retracted entirely within the shell; the head is small and elongated with a slender snout, at the tip of which are the nostrils; the feet are broadly webbed, with long straight claws on some of the toes. *Amyda mutica* has the upper jaw serrate and the carapace without tubercles. It is found in the region of the Great Lakes and the Ohio River. *Aspidonectes spinifer* has the cutting edge of the upper jaw smooth and the margin of the carapace with tubercles. It is abundant throughout the upper Mississippi Valley and particularly in the sluggish streams emptying into the Great Lakes. Closely related species are found southward. The soft-shell turtles are strictly aquatic, leaving the water habitually only in the spring, when about 50 spherical hard-shelled white eggs are deposited in an excavation above the level of the water. They spend much time buried in the mud at the bottom, either entirely concealed or with the head protruding from a hole. They breathe by raising the nostrils to the surface, or, if in water too deep, by means of a thick growth of vascular papillæ in the pharynx over which a current of fresh water from the nostrils continually passes. Strictly carnivorous, they feed upon all kinds of fish, frogs, mussels, snails and insects which come within reach of their ravenous jaws and which they seize with remarkable suddenness. They are powerful swimmers.

The order *Pleurodira* includes three families of recent and several of extinct turtles, the former being confined to the fresh waters of South America, Africa and Australia. The tartaruga of the Amazon is of great commercial importance. Unlike most turtles of this group they are said to be largely vegetarian, which probably accounts for the great value placed upon their flesh and fats. During the months of September and October vast numbers leave the water at about midnight to deposit their eggs in holes on the higher ground. Two related genera are found in Africa. The family *Chelydidæ* is confined to South America and Australia. The matamata (*Chelys matamata*) is common in Cayenne. Its length when fully grown is about three feet. It is remarkable in many ways; its snout is prolonged as in *Aspidonectes* and the head and neck are covered with tufts of cutaneous outgrowths which probably assist in the concealment of the animal in the thick aquatic vegetation among which it lives. It is carnivorous.

To the *Cryptodira* belong the great majority of living turtles and tortoises. This sub-order includes 10 or 12 families, seven of which have recent representatives. The *Cheloniidæ* includes the sea-turtles, in which the limbs are flat, scaly, inflexible paddles and the heads quite incapable of retraction within the shell. Only four genera and about seven species are known, all widely distributed. The three Atlantic species all occur on our shores more or less frequently. The best-known one is the green turtle, whose flesh is so highly esteemed in soups, etc. This species (*Chelone midas*) is the largest of sea-turtles, and reaches in some cases a weight exceeding 1,000 pounds. It occurs in all parts of the world when the water is not very cold, but most numerously about tropical archipelagoes. As with the other large sea-turtles, the most numerous catch is made when the females come on shore at egg-laying time, on moonlight nights in summer. Their retreat is cut off and the turtle turned on its back. When once in this position these turtles are unable to right themselves. They can endure many weeks without food and water, and hence can be transported great distances on seas in the hold of ships. Before the days of refrigerated meat they served as a welcome diet for sailors; and on some of the Pacific islands these and other large turtles were wholly exterminated by reckless slaughter. The green turtles feed on the roots of the eel-grass, and, betrayed by the floating tops of the grass, are sometimes taken in nets while feeding. The principal catch for the American market is now made in the neighborhood of the Florida reefs, where it forms a regular business with many boatmen. Their catch is largely made by spearing.

Another large and valuable turtle is the hawksbill (q.v.), which furnishes tortoise-shell (q.v.). A third species is the loggerhead (*Thalassochelys caretta*), which is much more frequently taken on the coast of the Middle and New England States than either of the others. It may be distinguished from the green turtle by the thin non-imbricated plates of the carapace, by having the central scale on the top of the head surrounded by a circle of more than 12 small scales, while the green turtle has seven; and by having two, instead of one, claws on the feet. This species reaches a large size, up to 500 pounds, and is carnivorous. It has no commercial value, but is sometimes sold as the green turtle.

A strictly American family (*Chelydridæ*) is that of the snapping-turtles (q.v.), including two well-known species of some commercial importance.

I. Leatherback Tu[illegible]

TURTLES

1. **Leather-back** Turtle. 2. Hawksbill, or Tortoise-shell Turtle. 3. Long-necked Turtle. 4. Matamata
5. Elephant Land-tortoise. 6. Wood-tortoise. 7. Snapping-turtle.

Numerous species of small or medium-sized pond, swamp and land tortoises belong to the families *Kinosternidæ* and *Emyidæ*. Of the first the well-known musk-turtle or stink-pot of boys (*Aromachelys odoratus*), found in every pond in the Eastern States, is an example. The diamond-back (q.v.) (*Malaclemmys centrata*) of the Atlantic salt-marshes, the red-bellied terrapin (*Pseudemys rubriventris*), the painted turtle (*Chrysemys picta*) and the speckled tortoise (*Clemmys guttatus*), three common pond-turtles of the East, the last two being familiar to every fisherman, *Clemmys muhlenbergi*, a less common species distinguished by its dull brown shell and a yellow blotch on each side of the neck, and found along meadow streams, and the map-turtle (*Graptemys geographicus*), chiefly of the Mississippi Valley, and distinguished by the yellow streaks and irregular lines which everywhere mark the shell and skin, all belong to the *Emyidæ*, which also includes the familiar land tortoise (q.v.), or box tortoise (*Terrapene carolina*) and numerous other species.

Of the true land tortoises (q.v.) (*Testudinidæ*), the gopher turtle (*Gopherus polyphemus*) of the Southern States, the European land tortoise (*Testudo græca*) and the gigantic Gallapagos tortoises (*Testudo*) may be mentioned. See LAND TORTOISE.

Besides the articles in this work on particular kinds of turtles consult Holbrook, 'North American Herpetology (Philadelphia 1842); Agassiz, L., 'Contributions to the Natural History of the United States,' Vols. I and II (Boston 1857); Boulenger, E. G., 'Catalogue Chelonians British Museum' (London 1889); id., 'Reptiles and Batrachians' (New York 1914); Hoffman, in Brown's 'Thierreichs' (Leipzig 1890); Taylor, 'Box Tortoises of North America' (Proceedings United States National Museum, Washington 1895); Gadow, 'Cambridge Natural History,' Vol. VIII (London 1901); True, 'The Useful Aquatic Reptiles and Batrachians of the United States' (Washington 1884); Williston, S. W., 'Water Reptiles of the Past and Present' (Chicago 1914). On fossil species consult Hay, O. P., 'Fossil Turtles of North America' (Washington 1908).

TUSAYAN, too-sä-yän', an ancient "province," comprising the tribal range of the Hopi or Moqui Indians of northeastern Arizona, which was first visited by Pedro Tovar and Juan de Padilla, of the expedition of Coronado, in the summer of 1540. It comprised seven villages or pueblos, probably all of which have since been abandoned and new ones built on near-by sites. Between the year named and 1583 two of the villages became depopulated, for in the latter year Antonio de Espejo visited the province of "Mohoce," consisting of the five villages of Shumopovi, Mashongnovi, Walpi, Oraibi and Awatobi, all but the last of which (which was destroyed about the year 1700) are still names of their present-day towns. In addition there are Shipaulovi, Sichumovi and Hano, which have been established in comparatively recent times, the last by a colony of Tanoan Indians from the Rio Grande in New Mexico. The Hopi Indians are peaceable, derive their subsistence through cultivation of the sandy soil and making excellent basketry and pottery. They still perform many aboriginal rites and ceremonies, the most celebrated of which is their snake dance, in which live rattlesnakes and other serpents are used. Their villages are all situated on lofty mesas, and their houses are generally similar to those of the other Pueblo Indians (q.v.). The Spaniards established missions among them as early as 1629, but they never took kindly to Christianization, and in 1680 murdered their Spanish priests. Henceforward little effort was made to convert them, but in recent years schools have been established in their midst by the United States government and an effort made to teach them the white man's ways, sometimes force being used to overcome their conservatism. The Hopi are kind, hospitable and industrious and have been regarded by ethnologists as the most primitive Indians within the United States. They number 1,841. Oraibi in the Moqui Reserve, Ariz., is their largest pueblo.

TUSCALOOSA, tŭs-kạ-loo'sạ, Ala., city, county-seat of Tuscaloosa County, on the Black Warrior River and on the Alabama Great Southern Railroad, about 52 miles southwest of Birmingham and 90 northwest of Montgomery. It was formerly the capital of the State (1826–46). It is in an agricultural region in which are grown large quantities of cotton. Extensive coal fields are in the vicinity. The chief manufacturing establishments are cotton gins, cotton compresses, flour mills, machine shops, iron smelters, coke ovens, lumber mills and creameries; coal mining and stock-raising contribute to the prosperity of the city. The principal public buildings are the courthouse, the Alabama Insane Hospital, the churches and schools. The educational institutions are Oak City Academy (Baptist), and Stillman Institute (Presbyterian), both for colored students, University of Alabama founded in 1831, University High School, a public high school, the Tuscaloosa Female College (Methodist Episcopal), Central Female College, Institute for Training Colored Ministers (Presbyterian), public elementary schools and libraries. Pop. about 12,000.

TUSCANY, tŭs'kạ-nĭ (Italian, TOSCANA, tôs-kä'nä), Italy, a compartimento, or territorial division, bounded by the divisions of Liguria, Emilia, Marches, Umbria and Rome, and on the west by the Ligurian and Tyrrhenian seas. It consists of the provinces of Arezzo, Florence, Grosseto Livorno (Leghorn), Lucca, Massa e Carrara, Pisa and Siena, with a combined area of 9,304 square miles. A number of islands off the coast form the Tuscan Archipelago. The greater part of the surface is mountainous with some enclosed river plains in the interior at Florence and Arezzo. Along the coast are the low, marshy and unhealthful regions of the Maremme. The principal rivers are the Arno, Cecina, Serchio and the Ombrone. The mineral wealth is very extensive, the chief products being iron, copper, mercury, lignite, fine Carrara marble, salt, boracic acid and sienna earths. The soil in the valleys is fertile, producing wheat, corn, grapes, olives, tobacco, chestnuts and flowers. The industries are very active and extremely varied. The capital is Florence, and the chief port is Leghorn. For ancient history and archæology see ETRURIA. After the fall of the Western Empire, Tuscany passed through various hands and

was finally made a duchy under the Lombards. In the 12th and 13th centuries it was broken up into a number of small republics, among which Florence held the leading place, and later it was reunited under the dukes of Florence, the Medici. After the extinctions of the Medici family it passed to the house of Lorraine, under which it remained, with an interruption at the time of Napoleon (see ETRURIA, KINGDOM OF), until it was annexed by Sardinia in 1860. It then became, with Sardinia, a part of the kingdom of Italy. See FLORENCE; AREZZO; PISA and appended bibliographies. Consult Cruickshank, A. M., 'Smaller Tuscan Towns' (New York 1912); Hewlett, M. H., 'Earthwork out of Tuscany' (ib. 1911); Hutton, Edward, 'Siena and Southern Tuscany' (ib. 1910); Seignobos, Charles, 'Political History of Europe since 1814' (English trans., New York 1900); von Reumont, Alfred, 'Geschichte Toscanas seit dem Ende des florentinischen Treistaates' (3 vols., Gotha 1876–77).

TUSCARAWAS, tŭs-kạ-râ'wạs, a river of northeastern Ohio; it unites with the Mohican and forms the Muskingum (q.v.). It is about 126 miles long. Massillon is the chief town on the river.

TUSCARORA, tŭs-kạ-rō'rạ (sig. probably «Indian-hemp gatherers»), a tribe of the Iroquoian stock of North American Indians, which, when first known to the whites, lived on the lower Neuse River and its tributaries, the Trent and the Contentnea, the Tar and Pamlico rivers, comprising the territory south of the present Raleigh, N. C. In 1711 they numbered about 4,000, in 15 towns. As the white settlers of North Carolina took from the Indians such lands as they needed, and as they also kidnapped young Indians for purposes of slavery in the West Indies and in the New England colonies, a large portion of the Tuscaroras, in 1711, incensed to bitter hatred toward the whites, formed with neighboring tribes a conspiracy to destroy all the settlers. The war which ensued lasted two years. On 26 March 1713 the hostile Tuscaroras were driven into a fort on Neuse River, where, after a severe conflict, they were defeated with a loss of 800 prisoners. Thus broken in power, the remnant of the hostiles migrated northward and in 1722 were adopted into the League of the Iroquois or Five Nations, in New York, forming the Sixth Nation. In the American Revolution the Tuscaroras espoused the cause of the colonists. They now number about 350 in Lewiston, New York, and 350 on the Six Nations reserve, Grand River, Canada. Neither portion retains distinctive pagan rites, and on the whole they are more progressive than their Indian neighbors.

TUSCULUM, tŭs'kū-lŭm, Italy, an ancient city of Latium, 15 miles south of Rome in the Alban Hills. Tradition has it that Tusculum was founded by Telegonus, son of Odysseus and Circe. Subsequently its relations with Rome were cordial, and bestowed upon it the right of citizenship. In the Middle Ages it became the seat of a powerful family of counts. In the 12th century it was destroyed by the Romans, whereupon the inhabitants built a new town in the vicinity — Frascati. Its beautiful location attracted many wealthy Romans, who established villas in the district. Distinguished among its residents were Lucius Crassus, the orator; Pompey, Hortensius, Lucullus, Scarus, Brutus, Cæsar and Cicero. This city existed until 1191 when the Romans destroyed it. The *Tusculanæ Disputationes* were written here. An ancient amphitheatre, theatre and fragments of the city walls belonging to the ancient city have been excavated. See FRASCATI.

TUSCUMBIA, tŭs-kŭm'bĭ-ạ, Ala., city, county-seat of Colbert County, on the Tennessee River, and on the Southern, the Northern Alabama and the Louisville and Northern railroads, about 174 miles northwest of Montgomery, and four miles below Florence, which is on the opposite side of the river. It was settled in 1812 and was incorporated in 1818. Tuscumbia is in a beautiful valley surrounded by hilly, almost mountainous land; the soil is fertile, the rainfall medium and distributed throughout the year, and the temperature favorable to agriculture and fruit-raising. The chief manufactories are railroad shops, agricultural-implement works, cotton gins and flour and feed mills. Pop. 3,500.

TUSK-SHELL. See DENTALIUM.

TUSKEGEE, tŭs-kē'gē, Ala., city, county-seat of Macon County, on the Tuskegee Railroad, a branch of the Western Railway of Alabama, 45 miles northeast of Montgomery. It was first settled in 1780 by Indian traders, was incorporated as a borough in 1800, and as a city in 1820. It is the centre of a fertile cotton-raising region; contains cottonseed-oil mills, cotton ginneries, brick kilns and saw-mills. It is also a pleasant winter resort. It is widely known as the seat of the Tuskegee Normal and Industrial Institute (q.v.), established in 1881, and is also the seat of the Alabama Conference Female College, Methodist, established in 1855. The city government is vested in a mayor and a council of six members. Pop. about 3,000.

TUSKEGEE NORMAL AND INDUSTRIAL INSTITUTE, a negro educational institution established by negroes in Tuskegee, Ala., for the education of students of their own race. The school was called into being by an act of Congress, and was opened in 1881 under the official name of Tuskegee State Normal School, and two years later this designation was changed to the present name. The growth of the institution was rapid and the attendance had reached near 2,000 in 1917. In this school have been trained many of the noted negro leaders of the country. Andrew Carnegie gave the college $600,000; and other gifts have raised the endowment fund to over $2,000,000 with the prospect of considerable additional funds in the near future. Tuskegee Institute possesses over 100 buildings, close upon 20,000 acres of public lands and a library of over 20,000 volumes, together with extensive modern school equipments. The faculty and office staff number close upon 200 employed in the home work of the college and in extension teaching; and the work which they are called upon to do is extensive, varied and far-reaching, embracing as it does the studies of the common school, the industrial school and the Bible-training institute and theological

seminary. Industrial training is one of the great features of the school; but it is not sufficient unto itself, since industrial instruction always goes hand in hand with the other educational work of the institute. The school curriculum includes day and night sessions, the latter being intended for students too poor to pay their way through college. Considerable stress is placed upon the teaching of the mechanical industries, and this department of the college covers everything from electrical engineering to shoemaking and the commoner trades of life. Attention is also paid to the industrial education of women in line with their lives. The extension work of the college, which is carried on through the Tuskegee Negro Conference, is largely directed to practical and industrial ends, in which agriculture receives special consideration. The name of Booker T. Washington (q.v.), its president until 1915, was as well known as the institute. Consult Washington, B. T., 'Up from Slavery' (1900); 'Working with the Hands' (1904); 'Tuskegee and its People' (1905).

TUSSAUD, tü-sō', **Marie Gresholtz** ("MADAME TUSSAUD"), founder of the well-known exhibition of wax-work in London: b. Bern, Switzerland, 1760; d. London, 16 April 1850. She learned the art of modeling in wax in Paris, where she assisted her uncle Curtius in his 'Cabinet de Cire' in the Palais Royal. For a time she gave lessons in modeling to Elizabeth, sister of Louis XVI, and in this way became acquainted with the leading personages at court. During the Revolution she was imprisoned for three months. In 1802 she established herself in London. The collection of over 300 portrait figures (that of Voltaire and others yet on view modeled by Madame Tussaud herself from life) with a remarkable collection of relics, is still one of the interesting features of London, where it is now managed by a company. Consult Hervé, F., 'Memoirs of Madame Tussaud' (London 1878).

TUSSER, tŭs'ẽr, **Thomas**, English agricultural writer and poet: b. Rivenhall, near Witham, Essex, about 1524; d. London, 3 May 1580. He was a chorister at Saint Paul's and elsewhere, studied at Cambridge, was for 10 years retainer and musician to Lord Paget at court, and farmed unsuccessfully in Suffolk and Norfolk. Later he was a singer in Norwich Cathedral, a tax-farmer in Essex, and a servant of Trinity Hall, Cambridge. Tusser of whom Fuller, in enumerating his vocations, says he was "more skilful in all than thriving in any," introduced barley-culture into England, and wrote the famous work 'A Hundredth Good Pointes of Husbandrie' (1557), later (1573) expanded into 'Five Hundredth Pointes of Good Husbandrie,' a series of practical directions on agriculture, written in rude dactylic verse, in which Sir Walter Scott finds he has "frequently attained . . . a sort of homely, pointed and quaint expression." Many proverbs have been derived from it. There have been many reprints and editions, including that for the English Dialect Society by Payne and Herrtage (London 1878). The rimes do not lack sound agricultural value, and Tusser has been styled the "British Varro." Consult Fuller, 'Worthies' (1662); Warton, 'History of English Poetry' (ed. Price 1840).

TUSSER, TUSSORE, or **TUSSEH,** the silk spun by the tusser silkworm. See SILKWORM.

TUSSILAGO, genus of plants of the general order *Compositæ*. The only species is the colts foot (*Tussilago farfara*), which is characterized by solitary flower heads appearing before the leaves. These are much sought after by bees and are, therefore, of economic value as honey producers apart from the general feeding value of the grass.

TUSSOCK-MOTH, one of the small grayish or brownish moths of the genus *Halesidota*, or some allied genus, whose cocoons are composed of silk and caterpillar hairs mingled, and are fastened in the interstices of the bark of trees. These moths defoliate trees, and feed upon a wide variety of hard woods. They are, consequently, a constant pest of parks and shade-trees, and measures must be taken to destroy the cocoons in winter, by scraping them off the trees or applying strong insecticides. A European species is a special pest of hop-vines. There are 20 species in the United States. The most destructive are the gypsy moth and the browntail moth which have wrought havoc in New England within the last 50 years. Consult Holland, W. J., 'The Moth Book' (new ed., New York 1905).

TUTELO, too-tā'lō. Strictly the name of a tribe of the former Monacan confederacy of the Siouan stock of North American Indians, who, when first known to the whites, in 1671, lived on the headwaters of the Dan in southwestern Virginia. The name, however, being a contraction of the Iroquoian designation (Todirich-roone) of all the Siouan tribes of the South Atlantic Coast was employed by the Iroquois in a more comprehensive sense. By 1675 the Tutelo tribe had drifted to the Roanoke River in southern Virginia, and by 1701 had occupied several parts of upper North Carolina, owing to pressure of the Iroquois from the north. Soon after 1711, with the remnants of the various tribes of Virginia and the adjacent parts of North Carolina, they were gathered at Fort Christanna, in the present Brunswick County, Va., where they became generally known as Christanna or Saponi Indians, although the latter name was strictly applicable to a single though cognate tribe. At Fort Christanna the tribes were thrown in contact with unprincipled whites, whose influence had the usual effect of rapidly degrading the Indians, although Governor Spotswood made an attempt to educate their children. The Iroquois raids continued, notwithstanding the proximity of the garrison, but these practically came to an end with the Albany treaty of 1722. Dissatisfied with their white neighbors, and particularly with the hanging of one of their chiefs, the Tutelo, Saponi and other confederated tribes resolved to follow the example of the Tuscaroras (q.v.) by placing themselves under the protection of the Iroquois. Consequently, about 1740, they began a gradual migration northward, settling first at Shamokin village, Pennsylvania, where Sunbury now stands. By 1748 they had settled at Skogari, in the present Columbia County, Pa., where they were described by Zeisberger as "a degenerate remnant of thieves and drunkards." In 1753 the Tutelo and their allies were adopted by the Cayugas, becoming a part of the Six

Nations. As the Iroquois espoused the cause of the British in the American Revolution, half of them, including most of the Cayugas, were driven into Canada, where they were settled on the Grand River reserve. The Tutelo went with them, erecting their village on "Tutelo Heights," a suburb of Brantford. About 1830 they still numbered some 200, but a smallpox epidemic in 1832 greatly reduced, and another in 1848 almost exterminated, the tribe. In 1871 the last full-blood survivors passed away. See Hale in 'Proceedings of the American Philosophical Society' (Vol. XXI, Philadelphia 1883–84); Hodge, 'Handbook of the American Indians' (Washington 1910); Mooney, 'Siouan Tribes of the East' (Washington 1894).

TUTICORIN, too-tē-kŏr'ĭn, India, a seaport in the province of Madras, situated on the northwest shore of the Gulf of Manar, 70 miles northeast of Cape Comorin. It is the terminus of the South Indian Railroad, has pearl fisheries and considerable trade. There are several cotton manufacturing establishments. Pop. 34,758.

TUTOR, *in Scotch law,* the guardian of a boy or girl while a minor. A father is tutor to his children by common law. Failing him, there may be three kinds of tutors — tutors nominate, tutor-at-law or tutor-dative, the division being borrowed from the Roman law. A tutor-nominate can only be appointed by the father, either under his will or by some writing clearly indicative of his wish. He is not generally bound to find security for his intromission with the estate of his pupil, but the Court of Session may ordain him to do so. A tutor-at-law is appointed by the court when there is no tutor-nominate, or when he dies, or does not accept. The nearest relation by the father is usually appointed if 25 years old and able to give security. But the tutor-at-law has only the custody of the pupil's estate, his person being entrusted to his mother, or, failing her, to his nearest relative on her side. A tutor-dative is named by the Crown when there is no tutor-nominate, nor at-law. The office is in all cases an unpaid one, and the tutor is bound to make inventories and to keep accounts. For certain important acts — selling land, for example — he requires the sanction of the Court of Session. Tutor is also applied to a Fellow of a college or university who discharges particular functions, the latter differing in various universities.

TUTTIETT, tŭt'ĭ-ĕt, **Mary G.** ("MAXWELL GRAY"), English novelist: b. Newport, Isle of Wight. Her first work was 'The Broken Tryst' (1879); but 'The Silence of Dean Maitland' (1886) at once brought her before the English and American public as one of the most notable of the later novelists, and is the book by which she will be longest remembered. Later works include 'The Reproach of Annesley' (1889); 'In the Heart of the Storm' (1891); 'Sweethearts and Friends' (1897); 'The House of Hidden Treasure' (1898); 'Ribstone Pippins' (1898); 'The Forest Chapel' (1899); 'The World's Mercy' (1900); 'Four Leaved Clover' (1901); 'The Great Refusal' (1906); 'Unconfessed' (1911); 'The Desire of the Moth' (1912); 'Something Afar' (1913); 'The Worldmender' (1916), etc.

TUTTLE, tŭt'l, **Daniel Sylvester,** American Protestant Episcopal bishop: b. Windham, Greene County, N. Y., 26 Jan. 1837. He was graduated from Columbia in 1857 and from the General Theological Seminary in 1862; was admitted to deacon's orders in 1862 and to the priesthood the next year. He was rector of Zion Church, Morris, N. Y., 1863–67, and in the year last named was consecrated missionary bishop of Montana, Utah and Idaho. He was translated to the diocese of Missouri in 1886, and in September 1903 succeeded Rt. Rev. Thomas March Clark as presiding bishop of the Protestant Episcopal Church. He is the author of 'Reminiscences of a Missionary Bishop' (1906).

TUTTLE, Herbert, American historian: b. Bennington, Vt., 29 Nov. 1846; d. Ithaca, N. Y., 21 June 1894. He was graduated at the University of Vermont in 1869, and soon after entered the field of journalism. His first newspaper work was in connection with the Boston *Daily Advertiser.* In 1872 he went abroad and for some years resided in Germany, where he became a correspondent of the London *Daily News,* the Glasgow *Herald,* and the New York *Tribune.* Here he devoted much time also to the study of German political history and international law, and upon his return to America was appointed resident lecturer in the department of political science at the University of Michigan, and in 1882 became professor of international law and the theory of politics at Cornell University. In 1890 he was appointed to the chair of modern European history at Cornell. He published 'German Political Leaders' (1876); 'History of Prussia to the Accession of Frederick the Great' (1884); and 'History of Prussia under Frederick the Great' (1888).

TUTUILA (too-twē'lä) ISLANDS, a group of the Samoan Islands (q.v.).

TUTUTUNNE ("people close to the water"). The name (1) of a gens or village on the north bank of Rogue River, above its mouth, in Oregon, and extended to include (2) a number of gentes or villages of the Athapascan stock of North American Indians in the same general locality. Little is known of the primitive customs of the tribe, but they formerly practised polygamy, and widows were buried alive in the graves of their deceased husbands. After hostility toward the government they were removed in 1856 to the Siletz reservation, where they have since resided. At the date mentioned they were officially reported to number 1,311, but they are now reduced to a few score.

TUY, twē, Philippines, pueblo, province of Batangas, Luzon, on Mantenlupâ River, 24 miles northwest of the pueblo of Batangas. It is surrounded by a cattle raising and agricultural region; and is connected with Balayan and the coast highway by road, and with the province of Cavité by a trail leading over the Sierra de Tagaytay. Pop. 2,430.

TVASHTRI, twăsh'trĭ, or **TVASHTAR,** in the Rigveda of the Hindus, the mythological creator, shaper or divine artisan, later classed among the Adityas or gods of heavenly light. He is the divinity who creates the gods, humankind, and animals, and rules their destinies. His daughter Saranyu, whom he married to Vivasant, was the mother of Yama and Yami, the primæval pair. The sun as the primary source of life and all blessings is supposed to

be the mythological origin of Tvashtri. Consult Barnett, L. D., 'Antiquities of India' (London 1913); and Macdonnell, A. A., 'Vedic Mythology' (Strassburg 1897).

TVER, tvār, Russia, (1) capital of the government of that name, on the Volga, 96 miles northwest of Moscow. It contains a Kremlin or fortress, surrounded by a wall, outside of the main town, has fine promenades, spacious open squares, handsome buildings, palace, churches, two monasteries, convent, Protestant and Catholic churches, etc. The cathedral of the Transfiguration is a remarkable structure with five cupolas, and fine mural paintings by Platon (18th century). Further a monument to Catharine II, theatre, various schools, seminaries and military academy. There are numerous manufactories, including cotton mills, iron-foundries, wagon works, saw mills, starch factories, etc. A brisk trade is carried on with Moscow and Petrograd. There are spacious docks and machine-shops. Pop. about 62,600. (2) The government contains an area of 25,225 square miles. The surface is mountainous, declining into a plain at the north. Forests are extensive and the fields yield rye, barley, hemp and flax. The Volga and the Dvina are the principal rivers. Cottage industries are extensive and produce linen, felts, shoes, axes, nails, crude implements, etc. There are also manufactories of cotton goods, leather, flour, etc. Pop. 2,250,200.

TWACHTMAN, twät'mąn, **John Henry,** American painter: b. Cincinnati, 4 Aug. 1853; d. Greenwich, Conn., 8 Aug. 1902. He came under the influence of Frank Duveneck in 1875, just as the latter was fresh from the studio of Pilotry at Munich, and was making a great impression in New York by his brilliant and rapid execution. Twachtman, at his suggestion, studied from 1875 to 1878 at Munich under Loefftz and subsequently at Paris. He eventually settled at Greenwich, Conn., developing an original line of artistic production, in which he tempered the crudeness of impressionism by a certain refined and tender sensibility, and manifested a fine sense of color in its most delicate shades and subtile combinations. He has been called a "minor poet of the brush." Without being a rich colorist, or a bold innovator he produced pictures fresh, original and finding their way to the heart by their pathetic simplicity, the truthfulness of their detail and the absence of all flourish and self-consciousness in the apparent ease and directness of their technique. His typical theme was a winter landscape, a stream of water rushing down a ravine, between thin edges of ice, and bare bushes on each side; a white house with dull colored roof, under a turbid gray sky; or the coolness, moisture and silence of a snow scene, whose atmosphere he suggested with truly marvelous felicity. If he was not fully appreciated in his lifetime his paintings will doubtless grow in popular estimation, and win recognition as vital incidents in the history of American art, gaining emphasis also from their personal interest as reflecting the artist's fine nature, his love of beauty in landscape, and his keen observation of the more fleeting and elusive phases of atmospheric change, the more sombre charms of rugged or barren scenery and clouded sky, in the seaboard of the Eastern States. An exhibition of his paintings was held in New York in 1913 and there was a Twachtman room at the Panama-Pacific Exposition, San Francisco, in 1915. His works are scattered throughout America, but he is well represented in all important galleries.

TWAT, twät, or **TUAT,** Sahara, a large group of oases situated to the south of western Algeria in lat. 27° to 29° N., and separated from the Atlas Mountains by the desert of El Erg. It contains several salt lakes, wadies and some artificial irrigation canals, and produces dates, wheat, senna, cotton, etc. The principal caravan routes from Timbuktu to Algeria and eastern Morocco converge at this point, and the trade is very important. The principal single oases are Guarara in the north and Twat proper in the south, the latter having several mosques and a population of about 49,000. The Algerian railway system reached Twat in 1912. It is in the French sphere of influence.

TWEED, twēd, **William Marcy,** American politician: b. New York, 3 April 1823; d. there, 12 April 1878. He was by trade a chairmaker and first gained political foothold through his popularity as foreman of the "Americus" Fire-Engine Company No. 6, known as "Big Six." He was an alderman in New York in 1852–53, United States congressman in 1853–55, chairman of the New York board of supervisors in 1856, school commissioner in 1856–57, deputy street commissioner in 1861–70 and State senator in 1867–71. From his appointment as deputy street commissioner the power of the famous Tammany Ring really dates. He was practically at the head of the department and with his support of unscrupulous political friends his power increased until when elected commissioner of public works in 1870 the "Tweed Ring" controlled practically every department of municipal expenditure. He increased enormously the city pay-roll, giving to political allies high-salaried sinecure positions. His largest scheme for robbing the city treasury was that of the county courthouse, begun in 1868 and planned to cost $250,000, but upon which $8,000,000 was reported as expended in 1871, leaving the building uncompleted. The charter of 1870 which placed the power of auditing accounts with certain city offices occupied by Tweed and his friends removed all restraints from the system of plundering devised by the unscrupulous politician and the amounts appropriated extended into the millions. A secret account of these depredations was kept in the auditor's office and in the winter of 1870–71 the items were copied by a clerk in the office and were printed in the New York *Times* in July 1871, resulting in the downfall of the "ring" in the election of the following November. Tweed was brought to trial in 1873 on a charge of grand larceny and forgery and sentenced to 12 years' imprisonment and a heavy fine. His sentence was reversed in 1875, but he was unable to furnish bail pending certain civil suits brought against him and was committed to jail. He escaped to Spain in 1875 but was brought back to New York on a warship and again committed to the Ludlow Street jail, where he died. Consult Bryce, 'The American Commonwealth' (new ed., 2 vols., New York 1910); McGuire, J. K., 'The Democratic Party of the State of New

York' (ib. 1905); Myers, G., 'History of Tammany Hall' (ib. 1901).

TWEED, Scotland, a river rising in Peebleshire at Tweed's Well and the largest stream of the country. At Coldstream it forms the boundary between England and Scotland and enters the North Sea at Berwick, after a course of 97 miles. Its chief tributaries are Gala and Ettrick Waters, the Leader, Teviot, Till and Whitadder. The chief towns on its route are Peebles, Melrose, Kelso, Abbotsford, Coldstream, Dryburgh, Norham Castle, etc., many of them rich in historical and literary associations. The river is celebrated for its trout and salmon fisheries. It is navigable for barges for a short distance above Berwick. Consult Crockett, W. S., 'The Scott Country' (1892); Lauder, T. D., 'Scottish Rivers' (1874); Veitch, J., 'The River Tweed' (1884).

TWEEDLEDUM and **TWEEDLEDEE,** a phrase used only in making reference to a distinction between the two. The suggestion is, of course, that the only distinction between the two is in sound, in other words a distinction without a difference. The expression arose in the 18th century in the course of a dispute between the admirers of Bononcini and those of Handel, as to the respective merits of those musicians. The matter was thus satirized by John Byrom (1692–1763):

> "Some say, compared to Bononcini,
> That Mynheer Handel's but a ninny;
> Others aver that he to Handel
> Is scarcely fit to hold a candle.
> Strange all this difference should be
> 'Twixt tweedledum and tweedledee."

TWEEDS, a certain kind of cloth, so called from the fact that its manufacture originated and was long exclusively carried on in towns on the Tweed and its tributaries. It is distinguished by the softness and flexibility of its texture, qualities which result from the manner in which it is made, the yarns not being so finely spun nor the cloth so closely woven or so thoroughly felted as is the case with the fine English cloths. Tweeds are also well known by their peculiar and endlessly varied patterns and mixture of colors, produced by weaving with dyed yarns. The manufacture is of comparatively recent origin; but the great demand for the material has led not only to the rapid growth of the manufacture in its original locality, but also to its extension to various other parts of Scotland and also into England, as well as to the imitation of the material in France and other continental countries.

TWELFTH CENTURY. This is the century of the crusades. The first crusade was preached in 1095 and the Latin kingdom of Jerusalem came into existence (1099) just before it opened. Men continued to go from Europe in large numbers during the first quarter of the century to strengthen the little Christian kingdom. The second crusade (1147) gave a new impetus and the third crusade (1190) attracted large numbers of men from Germany, France and England. It might be thought that with Europe pouring out hundreds of thousands of her men, the youth and chivalry of the time, so many of whom were killed or crippled, though the whole population was less than that of most of the countries now, the period would be distinctly one of sluggish transition and that great accomplishment could not be expected. In spite of all this the century witnessed the great beginnings of that magnificent intellectual and artistic movement at the end of the Middle Ages which culminated in the 13th century, a period that itself sent out the next three crusades. The intensity of feeling aroused by the heartfelt efforts of Europe to rescue the Holy Land from the Moslem more than made up for the physical losses and this deep stirring of the human mind and will led to some of the greatest achievements that humanity has ever made. The effect of this stimulus was noted all during the later Middle Ages and the movement affected all classes and made itself manifest in the smaller as well as the larger towns. The architectural impulse was felt particularly in northern France and was so widely diffused that "each village and hamlet of Northern France possessed a church that was commonly of real value. No matter how insignificant it usually contained some object of art of striking beauty, an altar piece or a painting or a statue or stained glass or a tombstone or wood carving or a bell or wrought iron work that still bear the stamp of the genius time." All this has been emphasized for us by the destruction caused by the Great World War and the effort to catalogue the losses. Other countries were but little behind France in following the impetus. Spain has a series of great cathedrals, the foundations of which are traced to this time, though the country was in the midst of a determined effort to free itself from the incubus of the Moors. Many of England's great cathedrals were begun before the 12th century closed, while in Italy the earlier Renaissance, as it is sometimes called, affected architecture, art and literature. Gothic or pointed construction — so-called in deprecation in the later Renaissance because not originating in classic antiquity it seemed only worthy of the Goths, their barbarous ancestors, came into existence. It has for its basic principle that ornament should not be for its own sake but spring from construction work, and the first hints of it have been traced to Sicily. The pointed style fascinated the crusaders on their return and the fashion for it soon became diffused all over Europe.

The political history is that of the crusades. The second crusade was preached by Saint Bernard, after the fall of Odessa, a frontier stronghold of the little kingdom of Jerusalem, awakened the fear that the Holy Places might again fall into the hands of the infidels Bernard was bitterly disappointed in what seemed its failure, but it saved Jerusalem for the Christians for a generation. The Holy City was taken by Saladin, the well-known sultan of Egypt (1187), and this brought on the third crusade in which the three greatest sovereigns of Europe, Frederick Barbarossa, the emperor of Germany, Richard I of England, the Lion Heart, the title won by his heroism in this crusade, and Philip Augustus of France took the cross (1190). The emperor led his troops by land, but the German crusaders suffered as did their predecessors on crusade from friction with the peoples of eastern Europe and from disease in Asia Minor. In spite of obstacles they achieved success, but Frederick was drowned, his troops became dis-

heartened, the Turks inflicted severe losses and only 5,000 out of 100,000 ever returned to their homes. Richard and Philip Augustus convoyed their troops by ship and joined their forces at the siege of Acre. The siege was long and costly, but in spite of all Saladin's efforts to relieve the garrison the city had to capitulate. A rupture between Richard and the French king led to the return home of Philip Augustus and his troops. The English king remained to complete the task of winning back Jerusalem, but in vain. The tales of the personal combats between Richard and Saladin and their immediate followers belong to romance rather than history, but have some foundation. Saladin proved an opponent worthy of the chivalry of Europe. Richard concluded a favorable peace with the provisions that the Christians should have free access to the Holy Places and hold all the coast from Acre to Ascalon. Richard's return was hastened by rumors that his brother John was plotting against his kingdom. On his journey from the Holy Land homeward the English monarch fell into the hands of his political enemy the German Emperor Henry IV, the successor of Frederick, and was imprisoned *incommunicado*. Blondin, the favorite minstrel of the king, wandering in quest of him, sang to his harp beneath the walls of Richard's German prison and his voice was answered by the king. The imprisonment of the champion of Christendom against the Turks evoked bitter protests, but Henry absolutely refused release except on payment of an immense ransom. The story has often been cited as typical of the political bad faith of the time, but analogous events are not rare in history, even in our time. Richard was so beloved of his people that even the enormous imposition demanded did not seem too much, and with the consent of the clergy they stripped the very churches to make up the sum. The Lion Heart returned to England to be enthusiastically welcomed by his people, though his death within a few years put John (Lackland), a younger brother, one of the most despicable of English monarchs, on the throne (1199).

Bishop Stubb's estimate of the crusades in his lectures on "Mediæval and Modern History," delivered as professor at Oxford, has now come to be the accepted view. "They were the first great effort of mediæval life to go beyond the pursuit of selfish and isolated ambitions; . . . they failed in their direct object, but that is only what may be alleged against almost every great design which the Great Disposer of events has molded to help the world's progress; for the world has grown wise from the experience of failure rather than by the winning of high aims. . . . They brought out the love for all that is heroic in human nature, the love of freedom, the honor of prowess, sympathy with sorrow, perseverance to the last." Besides they touched men's hearts and minds so deeply that they stimulated them to their highest activity and as a result the crusading generations and those which immediately followed them succeeded in accomplishing more great things that the world will never willingly let die than any other. They were a great manifestation of the power of the spirit of man, and while they brought immense material losses to Europe and entailed almost innumerable evils, they brought immense good.

The political hero of the time is Arnold of Brescia, born about 1100 and executed 1155, who came into enduring fame about the middle of the century. The Italian cities were at this time just developing independent republican existence under consuls with a senate and an assembly of free citizens. Arnold, a disciple of Abelard, campaigned for and obtained the re-establishment of the Roman republic. The Pope was deposed, a senate of 56 members was formed, the ancient letters S.P.Q.R. reappeared in the public documents, and the republic became a fact. Every city of any importance throughout Italy, except in the kingdom of Naples, followed the example and took on a republican form of government. The emperor Frederick I, known as Barbarossa, looked jealously at this spread of the spirit of democracy and crossed the Alps to assert his rights in the peninsula. Italy welcomed him with naïve confidence that he would confirm the established order. The emperor proceeded to use all his power against the young municipal republics. He restored the Pope and Arnold of Brescia was executed. When Frederick returned to Italy in 1158, reaction against him throughout Italy was general and when he attempted to place imperial officials over the Italian towns, many of them revolted. Frederick laid siege to Milan, which held out for two years and then yielded only to famine. The Milanese were compelled to destroy their *carroccio* which carried their standard of independence and the town itself was totally destroyed, many of the neighboring cities which bore old grudges being permitted to wreak their vengeance upon it. Frightfulness, instead of crushing the spirit of the Italian cities, aroused their patriotism. The league of the Lombard cities was formed and Frederick had to lead his forces into Italy six times. On his fifth expedition he was defeated by the Lombards at Legnano (1176) and was compelled at the peace of Constance to renounce all his claims over the Italian cities. Between the Italian cities and his own turbulent nobles, Frederick was almost constantly at war during a long life which was to end ingloriously in the Third Crusade.

The league of the Italian cities to preserve their liberties was one of the first confederacies organized in the modern spirit. Formed as the result of the conflict with the German emperor, they were unfortunately the scene of bitter conflicts between two parties among the Italians themselves, the Guelphs and the Ghibbellines, these being the Italian forms of the German names, Welf and Waiblingen. The Welfs or Guelphs were the Papal and popular party opposed to the Ghibbellines, the imperial and aristocratic party. The Welfs were so called from Welf I of a powerful family in the time of Charlemagne. Waiblingen was the name of an estate not far from Wurtemburg belonging to the House of Hohenzollern, hence its use as a rallying cry of the emperor's party at the battle. The names Guelph and Ghibbelline are said to have been first used as war cries at the battle of Weinsburg in 1140 in which the Hohenstauffen emperor, Conrad III, conquered Welf VI. The names lost their significance in Germany to a great extent to become extremely important in Italy and there continued to designate bitterly antagonistic parties till the end of the 15th century. The first Lombard League

included all the cities from Venice to Piedmont. Henry the Lion, chief of the Welfs, had refused to follow the emperor, hence the adoption of the name of the opponents of the emperor in Italy. The success of the effort of the league against Frederick led to its formation in the following century once more and brought the Italians their first appreciation of what a united Italy might mean.

Bishop Stubbs declared that the greatest man of the century in his influence on his own and subsequent times was Bernard of Clairvaux (1090–1153). At the age of 23, after an education which had awakened in him a taste for literature and tapped a vein of poetry, Bernard, wearied of the trifles of life, with 30 young noblemen of Burgundy who shared his feelings, asked for admission to the monastery of Citeaux, where the rule of Saint Benedict was being re-established in all its old-time rigor. Bernard responded so well to the monastic discipline that only three years later, Stephen, the abbot of Citeaux, sent him at the head of a group of religious to found a new monastery in the Vale of Bitterness (Absinthe) in the diocese of Langres. Bernard renamed the place *Claire Vallée,* or Clairvaux, Bright Valley, and his own name has had this for epithet ever since. Bernard though so deeply intent on mortification that his health was threatened by it, and the régime at Clairvaux was so austere that it would seem forbidding, had a marvelous attraction for men and numbers flocked to him. Even his father and six brothers came to share the peace and happiness of his religious life at Clairvaux. The monastery became so crowded that over and over again bands of monks had to be sent out for new foundations.

Here Bernard wrote his great books which are still often consulted and have been reprinted in most of the modern languages in our generation. Here he delivered his homilies and from here the letters were written which influenced his times so deeply and reveal the man to us. The poetic tendency of his earlier years was now turned to sacred poetry and Bernard wrote some of the most beautiful of hymns. He became known as *Doctor Mellifluous.* He was famous in philosophy and theology as well, and it was he who answered Abelard so effectively and yet with so little of acerbity that that distinguished university man felt that nothing more could be said. Bernard and Abelard became reconciled and Abelard became a monk at Cluny and a teacher in the school of the monastery. When the crusade of the middle of the century was to be preached, Bernard was felt to be the man of all others to lead it, and his voice stirred multitudes to take up the cross, and wonders attested by all who heard him enhanced his influence. The failure of the crusade to accomplish all that he hoped embittered the close of Bernard's life. The selfish pettinesses of men face to face with a great good work made him realize how little he could really touch them.

Bernard's opponent in theological controversy, Abelard, is the other famous intellectual genius of the century. He is remembered for his scholarship and his educational influence, but mainly for the romance in his life. Like so many errant geniuses of France, Abelard was born (*circa,* 1079) in Brittany, just coming of age for his life work in our century. He was destined to a military career, but preferred to become a wandering scholar, hearing the lectures of many of the renowned teachers of the day. Shortly after the beginning of the century he was at Paris for some time and occupied a chair in the cathedral school, the forerunner of the university, where he taught dialectics with great success. He became the idol of Paris and, as he says himself, had the world at his feet. In the midst of this adulation came the romance which ruined his career. The popular professor was engaged by Canon Fulbert to give lessons to his niece, Héloïse. She was deeply intellectual and became a devoted admirer of her brilliant teacher. She was handsome and before long the teacher was forgotten in the lover. There was a secret wedding after the birth of their son, and Héloïse retired to the nunnery of Argenteuil and Abelard gave up his professional career. He was but in minor orders at the time and now he became a Benedictine monk in the abbey of Saint Denis. He had a rather stormy career after this, one phase of which is touched upon in the paragraphs with regard to Saint Bernard, but the end of his life was spent in peace at Cluny. He was buried at the Paraclete, the nunnery of which Héloïse was the abbess. Their remains are now said to be in the cemetery of Père la Chaise (Paris), where their tomb is a place of sentimental pilgrimage. The surprise is to find a romance with all the modern elements working itself out over seven centuries ago.

Héloïse was not yet 20 when she met Abelard, a man of nearly 40, at the summit of his career, and was won by his prestige and his intellectuality. Later in life she attracted the attention of Peter the Venerable of Cluny and of Saint Bernard for her intellectual qualities, and the rules which she gave to her nunnery, the Paraclete, became the basis of the constitutions of many monasteries for women. She had great administrative power and her letters are a revelation of a wonderful mother heart, combined with an intellect of high order and a literary quality usually supposed to have developed only much later in history than the 12th century. The fault of her youth was amply expiated and she came to be looked up to as a great good woman whose advice on important questions was worth having and who was turned to by many of her contemporaries because of their thorough appreciation of her excellent judgment and her unselfish character.

The century had its intellectual life, many of the products of which have survived, mainly in the monasteries. Citeaux, Clairvaux, Cluny, have already been mentioned and the abbey of Saint Victor founded by William of Champeaux, archdeacon of Notre Dame, deserves a place beside these. William after lecturing to crowds of students in Paris, relinquished his chair and retired to a small hermitage dedicated to Saint Victor near the city, where he was followed by a great many of his pupils, Abelard among them, and was persuaded to take up his lectures again. This was the origin of the famous abbey and school of Saint Victor. With the schools of Saint Genevieve and Notre Dame, it afterward formed the basis of the University of Paris. Among its most distinguished scholars were many known only by their Christian names and distinguished by the appellative "of Saint Victor." There was Hugh of Saint Victor, termed

the Saint Augustine of his time because of his work in philosophy and theology and the breadth of his scholarship, and Richard of Saint Victor, a Scotchman, called the "mystic doctor" because of the lofty spirituality of his writings; then Adam of Saint Victor, whether a Breton or a Briton is not known, who wrote hymns which are among the greatest of the time, and this is the supreme period of hymn writing in history. Archbishop Trench declared Adam of Saint Victor "the foremost among the sacred Latin poets of the Middle Ages." Other Saint Victorians were Peter Comestor (d. 1178), the historian, Peter Lombard (1100–1164), the famous *Magister Sententiarum*, whose book was the basis of scholasticism and the subject of so many commentaries; Thomas the abbot of Saint Andrews, to whom Saint Francis sent young Saint Antony of Padua for his theological studies, and many others. Few schools in history have had so many pupils of enduring distinction in a corresponding space of time. The abbey was the centre of the intellectual life of Europe at this time and the Mecca for many distinguished visitors, not a few of whom came to remain for some time. The English were particularly interested in it, and the second abbot, Achard of Saint Victor, was either an Englishman or was related very intimately to the Normans in England at that time.

The hero of the century in the eyes of all his contemporaries and for centuries later was Thomas à Becket, the martyr archbishop of Canterbury (1118–70). A legend makes his mother a princess from the East who met his father on the crusades. Kept in duress by her father until à Becket's return to England, she escaped surveillance and followed with only his name to guide her. She found her lover to become a Christian wife and the mother of Thomas à Becket, later the archbishop. He was a brilliant student at Merton College, Oxford, and at Paris, and at 22 entered the service of Theobald, archbishop of Canterbury. He became a favorite of Theobald who sent him to study civil and canon law at Bologne and Auxerre. When Henry II succeeded Stephen as king of England, he made Thomas à Becket his chancellor at the age of 36. The king and his chancellor were said to have "but one heart and one mind." When Archbishop Theobald died in 1161, Henry selected Thomas as his successor. Thomas would have refused the offer saying "I know your plans for the Church. You will assert claims which I, as archbishop, must needs oppose." Henry insisted. The inevitable division of opinion foreseen by Thomas occurred, owing to the king's ambition, and the archbishop refusing to yield had, like many another archbishop, to go into exile. Reconciliation took place and Thomas returned to England but the disagreement as to Church and state rights recurred and the king said impatiently, before his nobles in Normandy, "Who will rid me of this troublesome Churchman?" Four knights immediately left the royal presence, crossed the channel to Canterbury, and finding the archbishop in his cathedral at vespers, slew him before the altar. The popular outcry over this bloody deed was intense. The king shocked at the unlooked for effect of his hot words did public penance, and for the rest of the Middle Ages and until King Henry VIII brought about the separation from Rome, the shrine of Saint Thomas at Canterbury was one of the most famous and one of the most visited in Europe. Many thousands of pilgrims found their way there every year. Chaucer has made the Canterbury pilgrimages live for all the after time though the destruction of the shrine put an end to them four centuries ago.

The 12th century witnessed a climax of the development of the right of sanctuary or the right of asylum as it is also called, which meant so much for the beginning of the reign of law instead of violence. It consisted in the privilege enjoyed by all those who were persecuted and were in danger of violence, whether the persecution was just or unjust, of flying to a church where they were guaranteed immunity against capture or violence of any sort on the part of their pursuers. This privilege endured so long as they remained on sacred ground. In the meantime the ecclesiastical authorities under whose protection the fugitive had come used their influence to secure justice or at least to calm the passion of the pursuer. What was needed above all was time and this was secured by this means. This right had been exercised during preceding centuries to very good effect, but a number of incidents during the 12th century shows that it was coming to be recognized by all, even by rulers, and that as a consequence many acts of injustice, some of them irreparable, which would have occurred if the fugitive were without refuge, were prevented. This right of sanctuary was without discrimination as to the social condition of the refugees and this fact had much to do with making social barriers less decisive than they had been.

JAMES J. WALSH,
Author of 'The Thirteenth Greatest of Centuries.'

PRINCIPAL EVENTS OF THE TWELFTH CENTURY.

1105. Henry I becomes King of England. Abelard opens a school of rhetoric at Paris. Héloise becomes his pupil.
1106. Henry V is crowned Roman emperor of Germany.
1114. The marriage of Matilda, daughter of Henry I of England, to Henry V, Roman emperor.
1115. Saint Bernard founds Clairvaux Abbey.
1118. Rise of the Knights Templars. By submission to the king the commons of France gain protection from the nobles. Villanage abolished.
1122. Abelard founds the monastery of the Paraclete of which his wife, Héloise, becomes superior.
1127. The Southern Sung dynasty established in China and exists under nine emperors until 1280.
1130. Creation of the kingdom of Naples and Sicily.
1133. Count Roger of Normandy invades Sicily.
1135. Stephen becomes king of England.
1138. Civil war in England.
1139. Portugal becomes a kingdom.
1141. Papal interdict laid on France.
1142. Death of Abelard.
1146. Saint Bernard preaches the Second Crusade. Roger of Normandy and Sicily invades Greece.
1152. The divorce of Louis VII of France from Eleanor, gives Guienne, Poitou, etc., to Henry II of England, who marries her, and wars ensue. The Troubadours flourish. The Albigensian persecutions begin.
1153. Death of Saint Bernard of Clairvaux.
1154. The Plantagenets assume power in England.
1155. Execution at Rome of Arnold of Brescia.
1156. Roman law and the Catholic religion definitely established in Germany.
1161. Thomas à Becket becomes archbishop of Canterbury.
1162. Milan is destroyed by Barbarossa.
1164. Death of Héloise.
1169. Invasion of Ireland by Henry II of England.
1170. Archbishop à Becket of Canterbury assassinated.
1176. Barbarossa of Germany leads his fifth expedition into Italy and is defeated by the Lombards at Legnano. The Peace of Constance is concluded. The first Lombard League is inaugurated.

1180. Philip II reigns over France. Summons John of England as a vassal.
1187. Saladin captures Jerusalem. The Third Crusade is preached.
1189. Circuit of justice introduced in England. Death of Henry II. Richard I of England, Barbarossa, emperor of Germany, and Philip Augustus of France join the Third Crusade.
1190. Defeat and death by drowning of Barbarossa. Siege and capture of Acre by French and English Crusaders. Quarrel between Richard and Philip, and withdrawal of the French from the Crusade.
1191. Saladin repulses all attacks on Jerusalem. Concludes a peace with Richard, giving Christians free access to all the holy places of Jerusalem.
1192. Capture and imprisonment of Richard I—Coeur de Lion—by Henry IV of Germany.
1194. Release of Richard by ransom.
1195. Several thousands of Europeans sacrificed in the Crusades. Return of the survivors.
1199. Richard I of England dies.

TWELFTH-DAY, Epiphany (the 6th of January), which is the 12th day from Christmas. This was formerly (as it still is) a day of great festivity and the evening of the day was the occasion of observing many curious customs. One of the most widespread of these was the baking of a cake (in England called twelfth-cake) with a bean in it, and dividing the cake among the partakers of the feast. Whoever got the piece with the bean in it was regarded as king for the remainder of the day, in France for the whole of the year. This custom is supposed to have been derived from that which prevailed among the Roman children at the end of the Saturnalia, of drawing lots with beans to see who should be king. In Italy it is customary to give presents to children on this day.

TWELFTH NIGHT. Just before Shakespeare began his series of great tragedies he wrote 'Twelfth Night' (1600–01) — the last of his great comedies. The play is notable for its blending of romantic beauty and charm in the story of the Duke, Olivia, Viola and Sebastian with a comic underplot in which are involved Maria, Sir Toby, Belch, Sir Andrew Aguecheek, Fabian and Malvolio. For the romantic story the author was indebted to several Italian stories which had been translated into French by Belleforest, and later into English by Barnaby Riche in his 'Apolonius and Silla.' The comic scenes and characters are the invention of Shakespeare, although they repeat many of the devices and effects of previous comedies. In fact the comic part of the play is a recapitulation of characters and incidents that had been successful in other comedies. Sir Toby and Sir Andrew belong to the family of Falstaff and Slender, while the clown is another Touchstone with a certain added maturity. The scenes in which the over-serious and self-centred Malvolio is made ridiculous by the clever devices of Maria are among the triumphs of Shakespeare's comic genius. Whether the interpretation of Malvolio's Puritanism as given in this play may be considered as Shakespeare's judgment is still a matter of debate. The conclusion of the comedy, in which the conflicting forces of love caused by the mistaken identity of Viola and Sebastian are resolved and the complete discomfiture of Malvolio is realized perfectly represents the subtitle of the play — 'What You Will.' The play was thus a sort of farewell to a type of dramatic writing in which Shakespeare had already achieved great triumphs. No comedy is more delightful or more fascinating. EDWIN MIMS.

TWELVE PATRIARCHS, Testaments of the, a work not recognized as in any sense Scriptural or authoritative, but of interest from the standpoint of ecclesiastical history. It was written in the 2d century after Christ, and purported to relate utterances of the fathers of Israel, foretelling the coming of the Saviour and discoursing on the results that would flow from that event. The predictions are modeled on those of Jacob, Gen. xlix, when the patriach blessed his sons and prophesied the future of them and their descendants before giving up the ghost. See APOCALYPTIC LITERATURE.

TWELVE TABLES, Law of the, the first written code of Roman laws, enacted in statutory form, having been drafted by a commission of 10 elected for the purpose and approved by the popular assembly (451 and 450 B.C.). It appears to have been a compilation of the older laws, founded on custom and precedent, but it formulated personal and property rights in such clear language that the patrician magistrates were no longer able to misinterpret and misapply them with impunity, as in former times. It was regarded by the people much as Americans regard the national Constitution, and Roman schoolboys learned the Twelve Tables by heart, even as late as the age of Cicero. A great body of rules grew up around the Twelve Tables, and as these called for expert legal interpretation, the study and practice of law gradually developed into a distinct profession. There remain to-day only fragments of this celebrated code. Many attempts at reconstructing it have been made, the latest by Voigt in 1883. Modern critics, never happy unless they can upset a tradition or two, contend that the Twelve Tables are a private compilation probably of the 3d century B.C. Consult Lambert, Edouard, 'Le problem de l'origine des Douze Tables' (Lyons 1902), and Appleton, C., 'Le testament romain: la méthode du droit comparé l'authenticité des Douze Tables' (Paris 1903). See ROME; DECEMVIRS.

TWENTIETH CENTURY. The opening year of the latest century was marked somewhat dramatically by the close of the long reign over the British Empire of Victoria of England, queen and empress, who died 22 Jan. 1901; by the assassination and death 14 Sept. 1901 of William McKinley, President of the United States, and by the accession of Theodore Roosevelt, Vice-President, to the chief executive office. Throughout the civilized world there was promise of peace and a growth of the spirit of humanity and internationalism. War between civilized nations seemed almost a thing of the past. Many World's Fairs, Universal Expositions, held in the preceding half century had brought the nations together as never before. Trade between nations as a medium for cementing friendship seemed to portend an ever-better understanding among rival peoples. The educated classes were drifting into a sense of security as regards war. A peace conference was held in Switzerland in the nineties and though it had broken up in disagreement the fact of its assembling seemed a great step forward. At the end of the century (1898) young Tsar Nicholas of Russia invited the nations to send delegates to a peace conference at The Hague. Most of them accepted. The conference was held (1899) and established a permanent court

of arbitration. Early in our century over 125 arbitration treaties between nations were arranged and statesmen considered the negotiation of such treaties as their highest activity. The second Hague Conference (1907) held at the invitation of the United States occupied itself with the drawing up of rules for humane warfare,—many of which were violated in the Great War. It strengthened the faith in peace and there were confident prophecies of a time soon to come when reason would rule international relations as it did personal relations since the disappearance of the duel.

In spite of the growing feeling that war was soon to be a thing of the past, when the century opened England was at war with the Boers and the United States was at war in the Philippines. In 1904 the bloodiest war that men had engaged in up to that time occurred between Russia and Japan. Just 50 years before Japan had been invited into the circle of civilization. When the Portsmouth (N. H.) treaty of peace (1905), signed largely through the influence of President Roosevelt, left Japan the victor, the yellow race had become a factor in world politics. Despite threatening incidents for seven years there was peace, but then the wars came thick and fast. Italy warred with Turkey over Tripoli (1912), the Powers refusing to permit the bombardment of Constantinople and limiting the war zone to Africa. The same year the first Balkan War broke out and the civilized world rejoiced when it seemed as though the defeated Turks were at last to be driven back to Constantinople. The dilatory diplomacy of the great nations in its fear of disturbing the balance of power, permitting Turkish atrocities to continue, made the world ready to welcome the removal of the sultan from Europe. The little Balkan nations, Greece, Serbia, Bulgaria, Montenegro, seemed about to accomplish what the "Great Powers" had balked over. Having disposed of the Turks with unexpected readiness the Balkan nations quarreled among themselves over the spoils and the second Balkan War, Greece and Serbia and later Rumania ranged against Bulgaria, proved one of the bitterest in the history of humanity. The same year the Mexican troubles, not yet concluded, began, and in the summer of 1914 the Great War broke out. The peace treaty was signed 28 June 1919 at Versailles, but fighting continued in many parts of Europe, so that no century of human history had so many wars in so short a time with so many killed and wounded and the end of it is not yet in sight.

The underlying motive of these wars was invariably commercial expansion. The Boer War resulted from English efforts for trade advantages in South Africa. The Russian-Japanese followed Russia's extension of her sphere of influence into Manchuria to obtain an ice-free port on the Pacific, her position in Europe denying her such an outlet for her commerce. In 1860 Vladivostok became a Russian port, but as it is closed during the winter Russia turned south toward Korea and the Manchurian coast. The Siberian Railroad was to be carried across Manchuria and its extension was made possible by the Japanese-China War (1895). The international convention after the Boxer Rebellion promised to shut out further encroachment on China, but Russia continued to advance and Japan declared war. Italy's war with Turkey was for Tripoli, the only portion of northern Africa left for the exploitation of European countries. The first Balkan War was almost a holy war in its purpose to expel the Turk, but the underlying motives were territorial expansion and commercial opportunities. The second Balkan War revealed this very clearly and was waged with supreme selfish disregard for human rights by grasping governments. The Mexican troubles were largely fomented by trade interests and grasping politicians. The Great War was rooted entirely in commercial rivalries and the fear that the growing power of other nations might prevent commerce and manufactures from having a free outlet into distant countries. Colonial expansion, the root of so many international difficulties, was almost entirely a matter of securing an outlet for the products of industry and the surplus population of European countries. The industrial era of the 19th century reached a climax of influence in which it was felt that the disposal of the industrial products of its people was the most important thing for government to secure. Many of the industries for which political striving was so earnest were employing men for such wages and under such conditions of health as made decent living almost impossible for a great many of those employed. The Great War produced internal conditions in all countries in which labor was in a position to claim rights that for a time seriously disturbed all national conditions. The war began for industrial expansion and commercial advantage redounded almost entirely to the benefit of labor in all the countries. What labor as the paramount influence in the lives of nations may do for mankind must depend on the ability of its leaders. With 7,000,000 able-bodied men killed in the war and another 7,000,000 so seriously crippled that they cannot do manual labor, at least 12,000,000 laborers were lacking from the world's labor supply. They were mainly the best labor elements, the able-bodied of military age. Their absence will surely affect the labor situation for some years to come. Everywhere then, as the second decade closes, there is unrest among the laboring classes and a striving for better wages. The outlook for better conditions for labor is promising unless political disturbances and a lack of community spirit are permitted to interfere.

Besides these wars a series of incidents all commercial in origin, carrying threats of war with them, occurred. In 1905 Germany's jealousy of the commercial rights which France had acquired in Morocco and which pointed to French absorption of that country seriously disturbed the world. The conference of Algeciras (1906) proved a diplomatic defeat for Germany, practically all the nations, including the United States, taking part against her. Germany's hopes were revealed. The German acquisition and fortification of Kiau-chau complicated the Far Eastern question; the proposed Berlin to Bagdad Railway with its strategic possibilities put another factor into the already complex Near East situation, while the rapidly increasing German navy threatened the development of superiority by sea as well as by land. This led to a lining up of the other

countries of Europe for self-defense. Germany's entrance into the Far East brought about (1902) an alliance between Japan and Great Britain, the first between a Western and an Eastern power. Mainly through the influence of King Edward VII (reigned 1901–10) England and France, hereditary enemies, composed long-standing difficulties (1904) and the hostility between England and Russia, due to their rivalry in Asia was replaced by an Anglo-Russian Entente. Persia, which had been a bone of contention between them, was divided into spheres of influence and a neutral section. Afghanistan, which had been a critical issue, was placed entirely under British influence and Tibet was to be respected. Great Britain, France and Russia thus made the Triple Entente as opposed to the Triple Alliance of Germany, Austria and Italy. This reconciliation of ancient enmities which brought about co-operation between these countries was due more to the influence of King Edward VII of England than any other single factor. After a rather stormy youth and a middle age given over to trivialities it seemed as though the long life of his mother, Queen Victoria, was fortunate in delaying his ascent of the throne and yet the 10 years of King Edward's reign accomplished much to align the world favorably for the great struggle that was to take place a few years after his death. He proved a diplomatic ruler of high order whose international influence was all for the best. The rapprochement between France and England probably saved Europe from war at the time of the Agadir incident when Germany sent a naval vessel to enforce her demands as to some compensation in Africa for the rights which France was securing in Morocco. The crisis was only delayed a few years.

The spirit of the time seething in so many wars had a beneficial effect in the political arena which will make the century forever famous in the history of democracy. Popular government and responsibility to the elected representatives of the people advanced as never before. The Liberals of England succeeded in modifying parliamentary law so that the veto power of the House of Lords on legislation was eliminated and as a consequence important measures of reform in taxation and franchise were passed. In Portugal King Carlos and the Crown Prince were assassinated 1 Feb. 1908 and Manuel II, younger son succeeded to the throne but in October 1910, fled before a revolution which set up a republic. The republic maintained itself though the monarchists have not ceased reactionary efforts. To the surprise of all, the Sultan of Turkey in July 1908 after a revolt in the army which threatened to prove serious proclaimed a constitution and elections were held and a new Parliament was opened in December. The Young Turks, representative of the better educated Ottomans' came to be the dominant party and liberalization was promised but the results were far from satisfying; cruelties continued and Turkey's entrance into the war against the Allies marked the doom of Turkish power in Europe. Austria took advantage of the disturbance in Turkey to annex Bosnia and Herzegovina placed under Austrian control by the Great Powers after the Russian-Turkish War. In October 1908 Prince Ferdinand of Bulgaria declared his country independent of Turkey and assumed the title of Tsar.

The most astonishing democratic development was the establishment of a republic in China where late in December 1911 a provisional republican government with Dr. Sun Yat Sen as President was proclaimed. This was all the more surprising because scarcely 10 years before the Boxer Rebellion (1900) had seemed to stamp China as hopelessly reactionary. The "Boxers," a secret society banded together for the extermination of the "Foreign Devils," laid siege to the foreign legations in Peking. A combined relief expedition from Japan, France, Germany, Russia, Great Britain and the United States occupied the Chinese capital, exacted a huge indemnity but signed an agreement for the maintenance of Chinese integrity. The dowager empress continued all powerful, for a decade, and then came the republic. In spite of certain reactionary movements, the President, Yuan Shih-Kai, "consenting" to be emperor for a time, the Chinese republic has maintained itself and in August 1917 entered the Great War on the side of the Allies.

In Russia the liberalizing tendencies of the young Tsar, so promising at the beginning of the century, gradually changed and utter autocracy prevailed. The Russian-Japanese War provided an opportunity for the liberal elements to press political reforms. With the army in the Far East the government had to yield but not until after the awful massacre of Bloody Sunday, January 1905, and harsh attempts at suppression which were rudely interrupted by the loss of the battle of Mukden (23 March 1905) and the annihilation of the Russian fleet in the East (27 May 1905). In August 1905 the imperial decree establishing a representative body, the Duma, though with very limited powers was issued. Unrest continued and a universal strike led to the granting of legislative powers. This body was arbitrarily dissolved the following year and another more complacent elected. This filled out its term as did the third Duma though without accomplishing much; but the fourth Duma was at hand in 1916 to demand the abdication of the Tsar when Russian affairs reached a crisis. The proclamation of a republic in 1917 seemed too good to be true and there are so many warring elements that the Russian people have still their political salvation to work out.

The greatest event of the century, the greatest of its kind in the history of humanity is the World War which lasted over four years and three months. On 28 June 1914, Archduke Francis Ferdinand, heir to the Austrian throne, with his wife, was shot to death in Serajevo, the capital of Bosnia. A bomb hurled by a printer aged 20 missed them, injuring others, but shots fired by a student, Princip, aged 19, proved fatal. Official investigation showed that the two assassins belonged to a Serbian secret society for revolutionary propaganda in Bosnia. Many Serbian high officials, hoping to unite the Serbs everywhere for action, were members of this. The annexation of Bosnia by Austria had aroused deep enmity in Serbia. Austria felt that this fomenting of revolution could no longer be per-

mitted. For the next three weeks Austrian diplomacy kept its own counsel, except so far as it was shared by Germany, but the authorities planned war against Serbia. In 1913 they had proposed aggregation against Serbia but Germany and Italy, as members of the Triple Alliance, refused to join it. The Austrian military purpose was so thoroughly hidden that many important diplomats and government officials of Great Britain, Russia and France, unsuspecting, went on their vacations in late July. July 23d, Austria's ultimatum to Serbia was delivered. War evidently was intended. No independent state could maintain its self-respect and accept the provisions. Behind Serbia stood Russia, unwilling to permit further Austrian encroachments in the Balkans. Germany was the ally of Austria and France of Russia and Great Britain had an understanding with both so that war would involve most of Europe. Serbia, taking counsel with foreign embassies, gave a most diplomatic reply, but could not submit completely. The Austrian Minister to Serbia withdrew at the end of the two days allowed for the reply and Austria declared war on Serbia 28 July. With Austrian mobilization, Russia mobilized and on this score Germany's Ambassador was instructed to withdraw from Saint Petersburg after having handed over a declaration of war 1 August. August 3d the German Ambassador to France declared a state of war because of aggressions at the frontiers. Germany seemed assured that England would not enter the war. The British Empire had but a few hundred thousand soldiers, the Boer War had been unpopular and had revealed British weakness and the threatened insurrection in Ulster, for which German munition plants supplied the arms, seemed to give assurance that England would refuse to enter a Continental war. Her great fleet made her mistress of the seas but it was felt that before this could count materially the war on the Continent would be over. When on 4 August it became known that German troops had invaded Belgian territory, Great Britain declared war. The German Chancellor in the Reichstag confessed that the invasion of Luxemburg and Belgium was "against the rules of international law" but the necessity of the situation demanded it. He promised "to atone as soon as our military end is attained." When the English Ambassador declared that the invasion of Belgium would mean war the German Chancellor suggested that "a scrap of paper" ought not to count for so much. Germany must be held responsible for the war at the bar of history, for though Austria precipitated it a word from Germany would have prevented it and not only was that word withheld but the publication of Austrian diplomatic documents (1919) shows that from early in July Germany urged such measures against Serbia as could only mean war. The most important witness against Germany is her own Ambassador in London during the crisis, Prince Lichnowsky, who published (1918) his account of the negotiations to prevent the war in which he found the English eager and anxious to avoid a conflict which they foresaw so clearly would prove ruinous for all concerned.

The first great phase of the war was the invasion of France by Germany with the idea that taken unawares the French would be put out of the war before slowly mobilizing Russia could be dangerous, and then the German armies might be turned to the Eastern front against the Russians. The advance of German troops through Belgium proved not only a political mistake, costing the sympathy of the world, but also a strategic error. The German armies were delayed in Belgium, affording time for French mobilization, though Belgium fortresses, supposed impregnable, rapidly crumbled before modern long-range high-explosive projectiles. The Germans approached Paris until the Eiffel Tower was in sight, when Von Kluck, commanding the German right wing, wheeled to the left (east) to cut off the French from their communications and precipitate a second Sedan on a far greater scale. On his exposed right wing a fresh army from Paris threw itself impetuously and the French centre under Foch holding, despite fierce attacks of Prussians and Saxons who were forced back, Von Kluck had to retire with immense losses and serious impairment of German morale. The plan of a short decisive war was at an end. The Germans entrenched and the long-drawn-out trench warfare of the next four years began. As Ivan Bloch had declared 15 years before, the spade proved more important than the rifle. This first battle of the Marne, fought along the historic river where for centuries Teutons and Franks had met, is one of the decisive conflicts of history. The ultimate conflict of the war was to be a second battle of the Marne, which also went against the Germans. After the first Marne battle the German objective became the Channel ports instead of Paris, and the bitter conflict of the fall and winter was in the mud of Flanders along the Yser around Ypres. The English and Belgians, supported by the French under Foch, heroically held against the massed attacks of the Germans though at awful cost in men. The "contemptible little" English army multiplied itself by valor. The Belgians, sturdily brave in misfortune, opened the sluices as their countrymen had so often done before against enemies, and the Germans were kept from the Channel ports.

On the Eastern front corresponding ultimate failure of objective met the Central Powers. The Germans defeated the Russians signally at Tannenberg, taking many prisoners. In August 1914 the Austrians planned an offensive, invaded Russia, but were driven back into their own territory, tried to reorganize there and lost another great battle, which gave the Russians possession of Lemberg, capital of Austrian Galicia. The Russians next invested the strongly fortified city of Przemysl, while the rest of their troops pushed on to the outskirts of Cracow, capital of Austrian Poland. Przemysl fell (March 1915) and the Russians from the heights of the Carpathians looked down on Hungary, which seemed at their mercy. The Germans had to rush men from their Western front to save the situation, and this afforded time for British army organization. Serbia was overrun and suffered intensely for the rest of the war. The Russians made a masterly retreat, came back under Brusiloff late in 1916, while the Germans were attempting Verdun and the Austrians were engaged with the Italians in the Trentino and

seemed in sight of victory. Austria had to hurry picked troops from the Italian front and the Germans had to summon forces even from Verdun to meet the overwhelming attack which carried the Russians to the very gates of Lemberg once more and gave them nearly 500,000 prisoners. Encouraged by Russian success Rumania entered the war on the side of the Allies 27 Aug. 1916. For a while her armies made progress against the Austrians, and there was hope of Russian co-operation, but the progress of disintegration had already begun in Russia and the supplies of food and oil to be obtained in Rumania tempted the Central Powers to a great drive which completely overwhelmed the Rumanians. The armies of the Central Powers entered Bucharest under Falkenhayn and Mackenson 6 Dec. 1916, and for the remainder of the war Rumania had to suffer as an occupied country.

In the spring of 1915 an attempt was made to take Constantinople. English troops, strengthened by forces from Australia and New Zealand, who had come by way of the Red Sea, landed at Gallipoli. The expedition was badly managed and in spite of the most heroic bravery made no progress. An attempt to aid the land troops by the British navy was answered by such well-directed fire that important naval vessels were sunk. A later British invasion of Mesopotamia seemed at first destined to like failure. Kut-el-Amara was captured by the British, but they were surrounded and had to surrender after intense suffering. Better organization led to the recapture of Kut, and Bagdad fell (March 1917) and Jerusalem was taken by the English troops (December 1917). One of the significant developments in connection with these expeditions was the self-sacrificing loyalty of the Dominion troops to Great Britain. The Australian-New Zealand auxiliaries (Anzacs) gave an example of bravery at Gallipoli that has never been surpassed. The Canadian troops stamped their names immortally on Flanders fields and proved second to none in the dauntless courage with which they attained objectives set them.

Having refused to take her part in the Triple Alliance with the Central Powers at the beginning of the war, Italy, unable to obtain the cession of *Italia Irredenta,* unredeemed Italy, that is territory occupied mainly by people of the Italian race still under Austrian rule, was forced by popular opinion to enter the war on the side of the Allies 23 May 1915. Gradually the Italian armies pushed their way into Austrian territory, greatly lessening Austria's power of resistance to Russian invasion, but making slow progress because of Alpine heights as the fighting terrain. The advance continued with some intermission all during 1916 and the greater part of 1917, when a surprise attack of German-Austrian troops brought the defeat of Caporetto (24 October), due partly to a new mode of attack, but mainly to a defeatist propaganda among the Italian troops. All northern Italy was laid open to the invader and over 250,000 prisoners were taken. The coming of British and French troops steadied the Italians and there was an immense patriotic reaction which strengthened the morale of the Italian troops. After this Italy proved a valuable factor in the war, claiming the attention of Austrian troops and proving a resource for Greece and the Balkan nations.

The year 1917 was the high tide of war effort and success for the Central Powers, and they felt on the strength of their position at the end of it that the war was surely won. Germany held most of Belgium and northern France, and the most determined and costly attacks had failed to dislodge her. Serbia overrun was held by the Central Powers and most of Rumania was in their possession. From Berlin to Bagdad German influence was supreme. The collapse of Russia enabled them to put their agents in control of large portions of it as the Brest-Litovsk Treaty revealed. The defeat of Italy back to the Piave in the autumn nearly put that country out of the war. There was doubt for a time as to whether Italy could come back effectually, but she did. The hopes of the Allies were at their lowest ebb just as America entered the war and the U-boat sinking of nearly 1,000,000 tons of shipping a month, unknown then, but now revealed, seemed to portend an enforced unfavorable peace. The situation grew worse in prospect rather than better during the spring of 1918, for German drives made disturbing progress. The appointment of General Foch as commander-in-chief of the Allied armies and the increase of Americans on the line in France gave renewed hope to the Allies. After Foch's counter-attack, beginning 18 July, the Central Powers crumbled, no other word can describe the unexpectedness of their collapse, and the armistice was signed 11 November.

The importance of naval power was demonstrated completely. The English fleet maintained its supremacy and protected England's commerce, so indispensable for the country. A single month's interruption of commercial intercourse would have put England in severe straits; two months would, it is said, have compelled capitulation. Germany's commerce was completely interrupted, though when submarine freighters came to the United States our genuine neutrality was shown by readiness to furnish supplies. This form of commercial relations proved too difficult and Germany's segregation from the world by sea more than any other single factor brought about German collapse and the end of the war. A great naval engagement was looked for between the rival fleets, but did not come. A portion of the German fleet met a strong detachment of the British (31 May 1916) but the engagement was hampered by mists and interrupted by darkness. The English lost about twice as many vessels and men as the Germans but their claim that the Germans escaped complete defeat only by retreat in the darkness was confirmed by the absence of any further attempt on the part of the German fleet to risk an engagement. After the armistice was signed the immense German fleet steamed across the North Sea and surrendered at Scapa Flow, where a few months later it was sunk by its officers in violation of their parole.

In spite of England's command of the surface of the seas the submarine warfare came very near proving the vital turning point of the war. Only the revelations made by Admiral Sims make it clear how serious were England's affairs from this danger when America entered the war. If the German U-boat campaign had

continued for even a few months to be as disastrous as it had been, British authorities felt that the end of the war could not be far off. American naval aid proved as important a factor for ultimate victory as military assistance on the Continent in the following year. American enterprise and ingenuity solved the problems of U-boat resistance and robbed this German naval arm, the real cause for the forcing of America into the conflict, of its power. Some 2,000,000 American troops were convoyed to Europe with a loss of scarcely a hundred, and communications which ensured the victualing and supply of our armies in Europe and of the English people were maintained in such a way as to prevent any serious interference with work or war.

Early in 1917 the Germans had finished enough submarines to make them confident of being able to put an end to English commerce. They declared a barred zone around the British Isles (1 Feb. 1917), offering a permit for one United States ship a week to reach Britain. Submarine warfare had already strained the relations with the United States; the sinking of the *Lusitania* (7 May 1915), with 1,200 men, women and children, over 100 American citizens, had created bitter feelings; other sinkings of American vessels were explained diplomatically, but the bitter feelings grew. When unrestricted submarine warfare was declared diplomatic relations were broken off and Count Von Bernstorff, whose connection with disturbing machinations in this country made him unpopular, was sent home. Sinkings continued, hostile relations with Mexico against the United States were attempted by Germany, and on 6 April Congress approved the President's declaration that the United States had been forced into the war. The United States was totally unprepared, but the first troops, regulars, reached France in July. It was not, however, until the beginning of 1918 that American troops in large numbers were sent to France. In the meantime peace negotiations had been suggested by Germany, and 8 Jan. 1918 President Wilson issued a program of world peace with 14 points, to be prominent on peace negotiations. The Quadruple Alliance: Germany, Austria-Hungary, Bulgaria and Turkey negotiated a peace with the Bolsheviki in control of the Russian government. This Brest-Litovsk peace, so called from the town in Poland where representatives met, showed that the Germans were intent on dismembering Russia for the benefit of the Central Powers. March 21, 1918 the Germans began a great "peace drive" on the Western front to force the Allies to sue for peace. The British were driven back almost to Amiens, but with the French held firmly. April 9 the Germans attempted to break through the British between Arras and Ypres to reach Calais and the English Channel. The British command to die at their posts, "backs to the wall," checked this. The third great German thrust came on 27 May and was answered by a counter-attack by the Americans, who took Cantigny. A week later the second and third American divisions stopped the Germans at Chateau Thierry. The German armies prepared for the fourth great drive, 15 July, and for three days seemed to be breaking through, but were held, and on 18 July Foch began the counter offensive. This was a complete surprise and proved the beginning of the end. Colonel Sargent in 'The Strategy of the Western Front' tells the reason: "But it was perhaps not so much the surprise due to the concealment of his forces prior to attack that deserves mention, as it was the surprise caused by the rapidity of the blows which he struck and the unexpected places where they fell. Hardly had the Germans been driven from the Chateau Thierry salient when Rawlinson attacked from the British front toward Chaulnes and Debeney from the Montdidier front toward Lassigny and Roye. These attacks were soon followed by Mangin's attack toward Noyon and Byng's toward Bapaume. Then came Horne's great attack from Arras toward Cambria and Douai, followed shortly afterward by Pershing's double attack against the Saint Mihiel salient." The American capture of the Argonne Forest was one of the great events of history. Many an army in preceding generations had tried to take the Argonne Forest by direct attack when the ground was not so thoroughly fortified as at this time, but no army ever succeeded in taking it until the Americans overran it at the end of September. This broke the spirit of the German armies, for it was recognized that there were millions more Americans to come over and that resistance was hopeless. As a matter of fact, all the preparations had been made to have 5,000,000 of Americans in France during the following year. The British forces in France are in striking numerical contrast. Mrs. Humphrey Ward published (1919) the official chart of the British general staff. The actual fighting strength January 1916 was 470,000. The maximum was reached (April 1917) 760,000. The number continued to descend and in May 1918 was 540,000 with but 465,000 on armistice day. At that time America's total forces in France were nearly 2,000,000 and 1,390,000 (General March's figures) were on the firing line. The French figures were not available but the opinion of military authorities is that they had less than 1,000,000 of men in actual combat on armistice day. The Americans had more than three times as many as the British and perhaps one and one-half times as many as the French. Nothing shows so clearly the factor that America was in ending the war as these figures.

The Peace Treaty saw the application of the principle of self-determination of the nations which made very important changes in the map of Europe. Finland became independent. Poland, which had disappeared as a country a century before, divided by Prussia, Austria and Russia, was now restored to its former status, the seaport of Dantzig on the Baltic being given to it. A new state, Czecho-Slovakia, consisting of the former provinces of the Austrian Empire, Bohemia and Moravia, was established. Hungary became independent of Austria; it was thus limited to a very small territory around Vienna. The Eastern Slavs formed Jugo-Slavia, consisting of Serbia, Croatia and Slavonia with Bosnia and Dalmatia. Race characters were made the foundation of boundaries in the Balkans. Greece acquired territory in Macedonia. Rumania had its territorial boundaries rearranged to include people of similar race. Bulgaria was restricted in its frontiers, and the Ottoman Empire in Europe disappeared.

At the beginning of this century the Irish problem, so thorny for several generations, seemed to approach solution. Land bills passed by Parliament had given the tenantry rights and the Congested District Boards solved housing problems. One of the first important applications of the elimination of the veto power of the House of Lords was made for a Home Rule bill, which passing the Commons three times and rejected by the Lords was signed by the king, thus becoming a law (September 1914). Because of the war it was suspended. For some time Ulster, the northern part of Ireland, though represented in Parliament by a majority of Home Rule members, had been threatening at least in and around the city of Belfast, to revolt if Home Rule were granted. They bought arms from Germany and openly drilled recruits. When the order was given to mobilize against them a number of the most important officers in the army refused to serve. In spite of this situation Redmond, leader of the Home Rulers, announced that the Nationalists would support the war. The continued suspension of the Home Rule Law caused grave discontent and in April 1916 an insurrection broke out in Dublin led by the Sinn Fein (Gaelic for "We ourselves," pronounced shin fāne), and proclaimed an Irish Republic with its own flag. The rebellion was suppressed, the leaders captured and ruthlessly put to death, though clemency to the Boers under similar circumstances had proved the value of a conciliation policy. The Irish people were rendered thoroughly disaffected and peace in Ireland has since been maintained by coercion. Though self-determination has come for practically all the other peoples of Europe, as the result of the war, it has not come for the Irish in spite of their age-long struggle for it.

A very prominent feature of the history of the century centres around votes for women. Certain of our Western States and New Zealand and Australia granted the suffrage to women in the later 19th century and with the establishment of The Commonwealth of Australia full Parliamentary suffrage was granted to women (1901). Finland (1906), Norway (1907), Sweden (1912), Denmark (1915) enacted woman suffrage. In England the suffrage leaders, tired of Parliamentary methods for securing the vote for women, resorted to violence. From 1905 to 1910 this policy was continued and, as has been the case with regard to manhood suffrage in the first half of the 19th century, proved more effective so that in 1910 a woman suffrage bill passed a second reading of the House of Commons but was then shelved. Violence continued but without legislative result though the question was being forced upon many minds. With the outbreak of the war the militant suffragists announced suspension of agitation so that the women might devote themselves to the country's needs. They rendered such service to the country in many ways that opposition to woman suffrage largely diminished. The Reform Bill of 1918 granted the ballot to women over 30 years of age with certain real estate conditions. This gives the franchise to some 6,000,000 of women. In the United States the Western States, which granted votes to women, had been well satisfied with the legislation and the suffrage movement was spreading even before the war. With the magnificent devotion to national purposes exhibited by the women of the country during the war other States granted the vote and opposition to woman suffrage in America notably lessened. Congress passed a bill authorizing an amendment to the Constitution granting the vote to women. This has to be approved by the legislatures of three-fourths of the States, but there is almost assured prospect of such approval.

Education suffered severely from the war. Attendance at European universities in the countries at war fell to a small percentage of what it had been before for all healthy young men were at the front. For a time it seemed as though university professors would have little to do but the war called many of them to do special work connected with their department for war purposes. The application of science so as to make war more destructive than ever sadly diminished the prestige of intellectual attainments. Soon another derogatory element exerted its influence. Most of the professors in German universities signed a document directed to the educated classes of the world, proclaiming that the war was not of Germany's making but was made by her enemies for her humiliation in jealousy of her magnificent progress during the past generation. Germany was waging defensive war for the Fatherland. A manifesto signed by 3,500 German teachers, professors and lecturers proclaimed the belief that the salvation of the culture of Europe depended upon the victory which Germany was about to achieve. The word culture became equivocal. German education was thrust from the pedestal which it had occupied in the academic world and lost the prestige which it had acquired, particularly here in America, during the preceding generation.

This revelation of the inner meaning of what was thought highest in modern education was due to the fact that German universities and schools were state institutions and faculties felt compelled to support government. The value of academic freedom was realized as never before, though it was pathetic to see that great mental attainments proved insufficient to give that independence of judgment which might be expected of men looked up to as leaders of the intellectual life of Europe. The tendency to set success in life as the principal goal of education was unveiled. The incidents led to a review of the reasons for German prominence in education and its definite elimination. At the end of the war Germany had lost not only her position in world affairs but above all her primacy in the academic world.

An even severer blow to the prestige of university teaching was the discovery that academic chairs had been made pulpits for the spread of the doctrines which animated the Central Powers during the war and which proved a shock to the rest of the world. The struggle for life had been taken in a very literal non-Darwinian sense as the order of the universe in securing the survival of the fittest. This was particularly applied to international affairs and charity and justice were supposed to be things apart from national aggrandisement. The three great apostles of these teachings, which had not been taken quite seriously out-

side of Germany but deeply influenced German academic minds, were Nietzsche, Treitschke and Bernhardi. Nietzsche, with some mental disturbance from early adult life, spent many years before his death in an insane asylum. In a series of books he supplied pan-Germanism with a basic philosophy. A typical expression was, "Ye say it is the good cause which halloweth even war, I say unto you 'it is the good war which halloweth every cause.' War and courage have done more great things than charity." Instead of the Christian law of charity Nietzsche proclaimed "this new commandment which I give you, Oh my brethren, Be ye hard." Treitschke was a professor of history at the University of Berlin attracting large audiences by the spell of his eloquence. The basic principle of his philosophy of history was that a state is not subject to the moral law. Its only policy is expediency and even its treaties bind only so long as it is advantageous to keep them. "A state cannot bind its will for the future as against another state. A state has no superior judge over itself and it will conclude all its treaties with this tacit reservation." Bernhardi, much read in Germany, was scarcely known in other countries, for his teaching seemed too contradictory of accepted principles to be taken seriously. It was the culmination of the philosophy of Nietzsche and the philosophy of history of Treitschke as applied to the 20th century situation. Bernhardi hailed war as the greatest good. Nature wanted the survival of the fittest and war brought that about. "Might is at once the supreme right and the dispute as to what is right is decided by the arbitrament of war. War gives a biologically just decision since its decisions rest on the very nature of things." The materialistic philosophy of the later 19th century had run itself out to its legitimate conclusions and a great educated people proceeded to apply those conclusions and the world then had to take them seriously.

The literary output of the century was mainly notable for its lack of serious significance. There was never so much reading in the history of humanity and books sold as never before and never so much attendance at plays and never so much money made by novelists and dramatists, but there is more than a serious doubt as to the enduring literary value of anything written in the century. The war stimulated some young poets "whose souls were touched by flame in the trenches" to flights of song higher than for a generation, but even with the stimulus of war nothing has been written that is taken seriously as great poetry and great literature. Reading has become very largely a recreation, attendance at the theatre to a great extent a dissipation of mind and serious thoughts are not welcomed. Large collections of books are available for all those who wish to make use of them but three out of four of the volumes taken from the libraries are of fiction, just as about the same proportion of the theatres are filled with audiences intent on light musical comedy. Great museums are visited by discouragingly few people, one in 10 or less of the population goes once a year, and popular education seems to have resulted largely in the cult of the trivial.

The 20th century was a period of enterprising invention and adventurous discovery. After years of effort the North Pole was reached by Peary 6 April 1909, and only two years later the South Pole was reached by Amundsen 16 Dec. 1911. He preceded Scott with a British expedition by but a few weeks. Wireless telegraphy became a means of communication even to the antipodes, invaluable for ships at sea, saving many lives; wireless telephony became an actuality. The triumph in invention was the solution of the problem of flying by the Wright Brothers in America. The Great War brought intensive development of aviation so that just after the war (1919) transoceanic flight was not a surprise. Facility of communication progressed, annihilating distance. Men developed ever so much greater power to use physical resources. There was some question whether the mental side of humanity was not pushed into the background by this. Rodin, the French sculptor, said that the telephone represented man's ear, stretched out to hear a thousand miles; the fast express train was a lengthening of his legs to get over ground as if with "seven league boots"; as man's mind remained the same, exaggeration of the body without corresponding mental development made a monster of him. During the Great War the applications of science added immensely to destruction and to the toll of human lives and suffering demanded by the struggle. Man's material progress proved as potent for ill as for good.

The world figure of the first two decades of this century is Theodore Roosevelt, born of an old Dutch family with a Celtic strain of which he was proud. He won back seriously threatened health by years of ranching in the West to be robust and vigorous, and developed into a man of broad views who in every position looked to the general good rather than that of any faction despite what might be the result for his own career. The Spanish-American War brought him into national prominence; elected governor of New York and then Vice-President for McKinley's second term, the assassin's bullet made him President at a moment when the "big interests" were in control of our politics. He set himself to oppose them for the benefit of the people, and while the advocates of special privilege roused opposition to him he became the most popular individual in the United States. Under his leadership the Progressives became a great factor in politics. His activity in bringing about the peace conference between Russia and Japan and the value of his influence in securing the acceptance of peace conditions made him a world figure. He put aside a third successive term as President though he might have argued that his first incomplete term did not bring him under the traditional restriction and there seems no doubt that he could have been President again. When the reactionary movement gained the upper hand he brought the defeat of President Taft and came to be looked upon as the most striking personality in the country whose opinions were considered as always thoroughly representative of the best interests of the whole people. At the beginning of the war he offered to organize and lead a division on the Western front. His four sons were prominent in the war. He died suddenly 6 Jan. 1919, re-

gretted by all his fellow-countrymen even by those who had not followed his leadership.

JAMES J. WALSH,
Author of 'The Thirteenth Greatest of Centuries.'

PRINCIPAL EVENTS OF THE TWENTIETH CENTURY.

1901. 22 January Queen Victoria of the British Empire dies. Edward VII proclaimed king and emperor. President McKinley shot 6 September, died 14 September. Theodore Roosevelt, Vice-President, becomes chief executive of the United States. Pan-American Exposition at Buffalo. Pan-American Congress in the city of Mexico. Hague court of international arbitration instituted. Australia extends the suffrage to women.
1902. Anglo-Japanese alliance to preserve the integrity of China and Korea. The first congress of the republic of Cuba assembles in Havana. Peace treaty signed between the Boers and the British. The California Pious fund controversy with Mexico arbitrated by The Hague tribunal. The Samoan dispute decided in favor of Germany by King Oscar of Sweden. Reciprocity treaty established between Newfoundland and the United States.
1903. Panama Canal Treaty rejected by Colombia. State of Panama secedes, proclaims a republic and concludes Isthmian Canal Treaty with the United States. Assassination of the king and queen of Serbia. Death of Pope Leo XIII; election of Pope Pius X. Alaskan boundary dispute decided in favor of the United States. Russia disregards Japan's representations over encroachments in Manchuria.
1904. Russo-Japanese War. Anglo-French treaty settles Newfoundland, African and other disputes. British expedition into Tibet reaches Lhasa. Louisiana Purchase Exposition at Saint Louis.
1905. Defeat of the Russian army and navy. Treaty of Portsmouth, N. H., ends Russo-Japanese War. Anglo-Japanese treaty of alliance renewed. Parcels post treaty effected between the United States and Great Britain. Norway separates from Sweden. Wright brothers invent the aeroplane.
1906. Pan-American conference at Rio Janeiro. Earthquake and fire destroys two-thirds of San Francisco. Franco-German embroglio over Morocco settled by the Algeciras conference. First Douma or Parliament opened in Russia in May, dissolved in July. Parliament opened in Persia. End of Dreyfus case in France. Separation of church and state in France. Norway independent elects Haakon VII king. China restricts the opium traffic. War between Central American republics.
1907. Second Russian Douma or Parliament lasts from March to June. In Finland, under full woman suffrage laws, 19 women are elected to the Diet. New Parliament opens in the Transvaal. Hostile demonstrations against British rule in India. In China, reform movement overthrows old educational and military systems. Universal suffrage in Austria strengthens the Socialist party. Women suffragists in England make violent demonstrations. The second Hague conference meets. Japanese laborers excluded by law from the United States except by passport. Interstate Commerce Commission in the United States prosecutes corporations for violation of the anti-trust laws. Tercentennial celebration of the settlement of Jamestown, Va.
1908. United States Congress remits $13,000,000 of Chinese Boxer indemnity. United States and Japan agree on Pacific Ocean affairs. United States severs diplomatic relations with Venezuela. King and crown prince of Portugal assassinated. Belgium annexes Kongo. Bulgaria declares independence. Sultan of Turkey restores the Constitution. The powers unite to prevent war.
1909. Austria annexes Bosnia and Herzegovina. Peary reaches the North Pole. Hudson-Fulton celebration at New York.
1910. King Edward VII of England dies; George V succeeds. South Africa union is proclaimed. Arizona and New Mexico admitted to statehood. Pan-American conference meets at Buenos Aires. Aerial navigation makes great progress.
1911. Revolution in Mexico. President Diaz resigns and sails for Europe. Francisco I. Madero elected President. Chinese National Assembly is dissolved. The republic of Portugal is recognized by the leading powers. War between Italy and Turkey in Tripoli. George V, king of England, crowned emperor of India at Delhi. Amundsen reaches the South Pole 16 December.
1912. China, the oldest of monarchies, becomes a republic 12 February. Italy annexes Tripoli 23 February but war continues with Turkey until 18 October and the signing of the Treaty of Ouchy. The Balkan League declares war on Turkey, 30 September and the first Balkan War begins.
1913. Parcel post system established in the United States. War of the Balkan allies against Turkey ended by the Treaty of London 30 May. The second Balkan War, between the Balkan Allies, begins 29 June, and is ended 10 August by the Treaty of Bucharest. President of Salvador assassinated. Ex-President Madero of Mexico assassinated. Woman suffrage introduced in Hungary. The first Parliament of China assembles. The Gettysburg semi-centennial celebration. Dedication of the palace of peace at The Hague.
1914. Direct wireless communication established between Germany and the United States. Treaties of arbitration ratified by the United States Senate with Great Britain, Norway, Sweden, Switzerland, Portugal, Spain, Italy and Japan. Formal opening of the Kiel Canal. Assassination of Archduke Francis Perdinand of Austria and his wife. Declaration of war by Austria against Serbia. The World War begins.
1915–1916. The World War.
1917. 2 April. The United States declares war against the illegal acts of the German government and joins the Entente Allies to end the conflict.
1918. Germany sues for peace and hostilities cease 11 November. See WAR, EUROPEAN, and related operations.
1919. Theodore Roosevelt dies suddenly 6 January. Franco-American-Anglo treaty of alliance defends France from unprovoked attack by Germany. Peace treaty, signed at Versailles 28 June 1919, reconstructs Europe and provides for a league of nations against war. Trans-Atlantic flights made by aeroplanes and dirigible balloons.

TWENTY THOUSAND LEAGUES UNDER THE SEA. This popular romance by Jules Verne tells an exciting story that makes a powerful appeal to the imagination of most young people and to not a few of their elders. The author launches immediately into his story, gives himself over to it, has confidence in it and trusts to events rather than to style to attain his purpose. As a result, no critic has ever spoken well of his style, yet all concede his ability to tell a rarely good story. 'Twenty Thousand Leagues under the Sea,' though written in 1869–70, before the invention of the submarine, remains to-day the most fascinating story of its kind, surpassed only by the truth, which has again shown itself stranger than fiction. Many details of Verne's sea-monster fit startlingly the modern submarine, and the present-day reader finds in the romance, if much to entertain, little to astonish him. The story is carried on by a well-balanced group of characters, not the least of whom is Conseil, the faithful servant, who captivates the boy reader as does Friday in 'Robinson Crusoe.' Apart from its series of thrilling adventures which render this romance of the sea so good a story, the book is most remarkable as an anticipation of events which actually surpass it in all the elements of romance. In this respect it is, and will remain, an example of the sheer prophetic power of the creative imagination.

RAYMOND WEEKS.

TWICE TOLD TALES, The, was the earliest published work of Nathaniel Hawthorne with the exception of a juvenile romance, 'Fanshawe.' After his graduation from Bowdoin College in 1825 Hawthorne lived a secluded life at his mother's modest home in Salem, and wrote and rewrote many tales. No publisher would accept a collection of these, but S. C. Goodrich brought out a number of them in his annual, *The Token*, and a few of them appeared in other places. It was not until 1837, when a college friend secretly gave the publisher a guarantee against loss, that these were collected and issued in book form. The title chosen calls attention to the fact that they had been printed before. An enlarged edition of the 'Twice Told Tales' appeared in 1842. The volume of 1837 was the first work of Hawthorne to bear his name, and it did some-

thing toward introducing him to the public; but it was not until the success of his romances directed attention to these earlier works that their value was fully perceived; and the author could still refer to himself as "the obscurest man of letters in America." The 'Twice Told Tales' occupy an important place in the development of the short story in America, and the best of them show all the distinctive qualities of Hawthorne's work. While he had no definite and preconceived theory of the short story, Hawthorne's feeling for form and proportion led him to produce stories that marked a great advance on those of his predecessors. It was in his reviews of the 'Twice Told Tales' that Poe first formulated his dicta regarding the short story which have since been accepted by almost every critic of that literary form. Among the characteristics of Hawthorne seen in the 'Tales' are his fondness for old New England settings, as in the four 'Tales of the Province House,' 'The Gray Champion' and many more; his interest in psychological studies, and especially in those which involve the effect of some sin or ambition on the soul, as in 'Wakefield,' 'The Minister's Black Veil,' 'Lady Eleanor's Mantle,' etc.; his habit of centring his tales about a material object, as in the 'May-Pole of Merry Mount,' 'Endicott and the Red Cross' and others already named; and his use of an elusive but powerful suggestiveness, which varies from a passing hint like the falling of the withered rose-leaves in 'The May-Pole of Merry Mount' to the carefully elaborated ending of 'The White Old Maid.' The volume also contains a few pieces like 'Sights from a Steeple' and 'Sunday at Home,' which are in no sense tales, but which illustrate the author's power of interesting the reader in a quiet account of slight and seemingly unimportant details. Even in the tales proper, the plots, judged according to standards developed by later writers, are not especially elaborate or ingenious. The portrayal of character is not always vivid, though the reader is rarely conscious of any notable deficiency in this respect. The author excels in the representation of ordinary human beings in situations that produce mental or moral stress, in the creation of an effective atmosphere or tone and in so weaving his incidents and foreshadowing their outcome as to produce a perfect impression of unity. Those who wish to make a careful study of one of the tales for the sake of Hawthorne's technique can do no better than to choose 'The Ambitious Guest.'

WILLIAM B. CAIRNS.

TWICHELL, Joseph Hopkins, American Congregational clergyman and author: b. Southington, Conn., 1838. He was graduated at Yale in 1859, and served as chaplain during most of the Civil War. In 1865 he accepted a call to the Asylum Hill Congregational Church, Hartford, Conn. His writings include 'John Winthrop' (1891) and 'Some Old Puritan Love Letters' (1893).

TWICKENHAM, twĭk'n-ăm, England, a town or urban district of Middlesex, on the Thames four miles southwest of London. In the 18th century it was a fashionable resort. It is now a residential suburb. Here are Walpole's villa and Orleans House, once the residence of Louis Philippe. Pop. 29,367. Consult Cobbett's 'Memorials of Twickenham' (London 1872).

TWIG-GIRDLER; TWIG-PRUNER. See GIRDLER.

TWIGGS, twĭgz, **David Emanuel,** American soldier: b. Richmond County, Ga., 1790; d. Augusta, Ga., 15 Sept. 1862. He was appointed a captain in the Eighth Infantry in March 1812, served in the War of 1812 and in 1814 was promoted major. He also fought in the Seminole and Black Hawk wars, and in 1836 reached the rank of colonel. During the Mexican War he rendered important services, and was brevetted brigadier-general for his conduct at Palo Alto and Resaca de la Palma, where he commanded Taylor's right wing. He commanded a division at Monterey, received the brevet of major-general, was for a little while governor of Monterey and then joined Scott at Vera Cruz. He commanded the Second division in the advance on the City of Mexico; at Cerro Gordo he led the attack, and at Contreras and Churubusco and at the city gates he performed efficient service. In 1861, while in command of the Department of Texas, he unresistingly surrendered to the Confederates the United States property entrusted to his care, and was in consequence dismissed from the army. Entering the service of the Confederacy, he held a brief command in Louisiana, but toward the end of 1861, on account of infirmities of age, he resigned.

TWIGGS, Levi, American marine officer, brother of David Emmanuel Twiggs: b. Richmond City, Ga., 1793; d. Chapultepec, Mexico, 13 Sept. 1847. He entered the marine corps as second lieutenant in 1813, and was senior officer of marines on the frigate *President* during her last cruise under Decatur. At the outbreak of the Mexican War he joined the expedition under General Scott and was killed in the assault upon Chapultepec.

TWILIGHT, daylight which continues after sunset, called crepuscular light. Twilight is occasioned by the reflection of sunlight from the higher parts of the atmosphere which are still illuminated after the sun has become invisible from ordinary heights. Light is reflected from the upper air till the sun is about 18 degrees below the horizon, but the duration of twilight is manifestly much influenced by the state of the atmosphere as to clouds, etc. In low latitudes, both on account of the quickness with which the sun traverses the 18 degrees below the horizon and because of the transparency of the atmosphere, there is little twilight. On the other hand, in latitudes higher than 43 degrees twilight at certain times of the year lasts from sunset to sunrise.

TWILIGHT SLEEP. This term is used as the equivalent of the German term Dämmerschlaf, a fanciful term applied by Krönig and Gauss for the method used by them in the delivery of parturient women at their private hospital for women in Freiburg, Germany. It was claimed by them in 1914 that they had been using it for 15 years with great success and they certainly have been fortunate in spreading abroad the knowledge of it and drawing patrons from many parts of the world. It consists in the hypodermatic use of a combination of scopolamine and morphine in solution

from the beginning of labor pains and continued at sufficient intervals to keep the patient semi-narcotized and in a state of amnesia so that she is oblivious of the fact that she is in labor or that she has labor pains, or even that she has a baby when it is born. The dosage is graded according to the tolerance of the patient and repeated as often as she appears to be coming out from its influence. Krönig and Gauss assert that it is uniformly or nearly uniformly satisfactory in depriving labor of its suffering, that it has few fatalities, that occasionally, rarely, an infant is apparently narcotized, but that suitable effort will always, or nearly always, relieve this. They insist that it is a great boon for women to proceed to labor with the assurance that the much dreaded pain of that ordeal will be eliminated, that the mental effect will prove very stimulating and offer to the woman a much more desirable prognosis than she could have by other methods of treatment at present in vogue.

An account of the method of treatment at the Freiburg institution was published by two laymen (women), who had been there and familiarized themselves with the method, in *McClure's Magazine* for June 1914. The treatment requires the constant attendance and watchful care of the physician from the moment the first hypodermic of the mixture is given. It is quite possible that it may result in morphine poisoning if given unadvisedly and there is a very real danger that the infant may be still-born. It seems a little strange if the method has all the merits which are claimed for it that it should have been used so long in Germany and not have found favor at the great maternities at Berlin, Munich, Vienna, Prague and elsewhere, but none of these great institutions seems to have been sufficiently impressed with its importance to take it up and use it as a matter of routine in its obstetric service.

After the appearance of the article above mentioned the method was tried in several hospitals in New York and Brooklyn and under skilful obstetric management. In the two years which have passed since then it has been used in some hundreds of cases with very good success, as reported in various contributions by those who have tried it and advocate it. But it has failed to meet general approval with obstetricians just as it seems to have failed to excite enthusiasm in Europe.

The combination of these drugs has been used in this country a number of years as a preliminary to general anæsthesia before the performance of a major surgical operation. Its effect in the experience of the writer in such use has been good; it calms the patient's fear, slows the pulse and keeps it slow during the operation, and relieves the patient of the post-operating tendency to vomiting. Also the patient may sleep uninterruptedly for many hours after the operation, which frequently is a great advantage.

It is not receiving the attention or discussion which it had a year ago, and it seems likely that the slight wave of popularity with which it was ushered in has passed along, like anæsthesia by injection of certain fluids into the spinal canal which a few years ago was used by numerous obstetricians but now has been practically abandoned because of its danger. For many years obstetricians have made use of ether and chloroform during labor and it would be hard to imagine anything more effective than one or the other of these in relieving the severe pain of parturition when it is properly given. Its effect passes off more quickly than the scopolamine-morphine combination and when chloroform is used it is rarely followed by vomiting or other unpleasantness. There is a mortality to ether and chloroform, and also a certain morbidity, but the percentage is so small it would be unwise to discard such beneficent helps. If it were possible for the use of scopolamine and morphine to be applied to 100,000 unselected cases and compared with an equal number of cases in which chloroform was used it is probable there would not be a very great difference in the mortality and morbidity of the two methods. It is quite improbable that there will be any revolution in obstetrics from the twilight sleep influence and from present appearances it will very soon be one of the curiosities in obstetric practice.

TWILL, a textile fabric, in which the weft threads do not pass over and under the warp-threads in regular succession, as in common plain weaving, but pass over one and under two, over one and under three, or over one and under 8 or 10, according to the kind of twill.

TWIN FALLS, Idaho, city and county-seat of Twin Falls County, on the Oregon Short Line Railway, 35 miles south of Shoshone. Abundant water power is provided by the Shoshone Falls. It has a general manufacturing business and makes candy, harness and vinegar. Pop. about 5,000.

TWIN-LEAF, an herb (*Jeffersonia diphylla*) of the barberry family, found in the northeastern United States. It has solitary four-parted white flowers, an inch across, borne on slender scapes, and succeeded by capsular fruits. The radical, long-petioled leaves are peculiar, the cordate blade being divided to the very base, forming two obliquely ovate lobes, entire, or again somewhat lobed, glaucous beneath and appearing to be twin leaflets. The leaves arise in tufts from a thick, horizontal rootstock, which is somewhat fleshy, and is said to be stimulative and antispasmodic. It has been employed as a remedy for chronic rheumatism.

TWISS, Sir Travers, English jurist: b. London, 19 March 1809; d. there, 15 Jan. 1897. He was graduated at Oxford, and afterward from 1842 to 1847 was professor of political economy there. In 1852–55 he occupied the chair of international law at King's College, London, and in 1855–70 was regius professor of civil law at Oxford. In 1862 he was made advocate-general of the British Admiralty, and in 1867 was knighted and appointed advocate-general to the queen. In 1872 he retired from public office, but was occupied with various state affairs, notably with the drafting of a constitution for the Kongo Free State, for the Belgian government, and in 1884–85 was counsel extraordinary to the British embassy at the Congress of Berlin. His published works include 'The Oregon Territory: Its History and Discovery' (1846); 'View of the Progress of Political Economy in Europe Since the Sixteenth Century' (1847); 'The Law of Nations' (1861–63); 'Monumenta Juridica: The Black

Book of the Admiralty' (1871–76) and 'Belligerent Rights on the High Seas' (1884).

TWO GENTLEMEN OF VERONA, The. 'The Two Gentlemen of Verona' would seem to be Shakespeare's earliest attempt at romantic comedy of the popular Italian sort. The play is mentioned in Meres's list in 1598, but was not printed before the folio of 1623, and appears to have been little acted either in Shakespeare's time or since. No evidence for a very early date exists except the logical improbability that this comedy could have been written by Shakespeare as late as 'A Midsummer Night's Dream,' 'The Merchant of Venice' and other works which show much higher mastery in the same line. As 'Love's Labor's Lost' is particularly a study in language and 'The Comedy of Errors' in plot construction, 'The Two Gentlemen of Verona' is primarily a study in characterization — crude as yet but interesting in its foreshadowing of what Shakespeare was later to do. We are reminded of 'A Midsummer Night's Dream' in the interlocking fates of the contrasted pairs of lovers; of 'The Merchant of Venice' in Julia's talk to Lucetta of her suitors and in the servant-clowns; of 'Twelfth Night' in Julia's disguise; of 'Romeo and Juliet,' finally, in Valentine's device of the rope-ladder, in the rendezvous of Silvia and Eglamour at Friar Patrick's cell, and in the passing mention of Friar Laurence (IV, ii, 37). 'The Two Gentlemen of Verona' is notably deficient in ability to portray real feeling. The plot proceeds by the help of conventional tricks and artificial dialogue. The representation of the awakening of love in Julia (I, ii) and in Silvia (II, i) is quite insincere, while the indifference with which Proteus's perfidy is treated and the essential weakness of Valentine chill the reader. There are, however, three elements of promise: the breath of deeper sympathy in the play's best scene (IV, ii), where Julia and the Host look on while Proteus woos Silvia; the fine song, one of Shakespeare's best, in this same scene "Who is Silvia, What is She?" and the melancholy Launce with his dog Crab. The story of Valentine was perhaps invented by the dramatist, but the part of the plot which concerns the fickle Proteus and the true-hearted Julia is apparently an adaptation of the tale of Felismena, one of the episodes in Montemayor's long pastoral novel, 'Diana Enamorada.' An English translation of this Spanish work was not printed till 1598, but several versions seem to have been current earlier in manuscript, and the outline of the tale was otherwise available.

TUCKER BROOKE.

TWO HARBORS, Minn., city, county-seat of Lake County, on the Duluth and Iron Range and the Lake Superior railroads, 28 miles northeast of Duluth. It is a large ore shipping point and also ships lumber and pulp wood. Pop. about 5,500.

TWO KETTLE INDIANS (mistranslation of Oóhenónpa, lit. "Two-boilings"), one of the seven divisions of the Tetons, who in turn form part of the great Dakota confederacy of the Siouan linguistic stock, the other divisions being the Brulés, Sans Arcs, Blackfeet or Sihasapa, Minniconjou, Oglala and Hunkpapa. The Tetons took possession of the Black Hills region of North Dakota, which had previously been occupied by the Crow Indians, long before white men came. They were noted for their prowess in war, and have had, with other Siouan tribes, numerous conflicts with the whites. The Tetons are on reservations, as follows: 4,907 Brulé, Lower Brulé, "Northern," Loafer, under Rosebud agency, South Dakota; 467 Lower Brulé under Lower Brulé agency, South Dakota; 2,471 Blackfoot Sioux, Minniconjou, Sans Arcs, and Two Kettles under Cheyenne River agency, South Dakota; 6,608 Oglala under Pine Ridge agency, South Dakota; about 500 Blackfoot Sioux and 500 Hunkpapa under Standing Rock agency, North Dakota. Total Tetons (est.), 18,098, not including Sitting Bull's refugees in Canada, about 100 in number.

TWO NOBLE KINSMEN, The, a pathetic drama founded on Chaucer's' 'Knighte's Tale,' and first printed in 1634, with the names of Shakespeare and Fletcher on the titlepage as authors. That Shakespeare wrote any part of it is not now believed, but Massinger and Rowley are sometimes suggested as collaborators with Fletcher.

TWO-PHASE SYSTEM. See ELECTRICAL TERMS.

TWO RIVERS, Wis., city in Manitowoc County, on the Chicago and Northwestern Railroad and on Lake Michigan, seven miles northeast of Manitowoc. Its manufactures are office furniture, dentists' and printers' cabinets, gasoline engines, aluminum novelties, woodenware and knit goods. Pop. about 6,000.

TWO SICILIES, Kingdom of the. See SICILIES, THE TWO.

TWO-THIRDS RULE, a provision of constitutional and parliamentary law intended to restrain and prevent unjust and inconsiderate action on the part of majorities. It was unknown in the legislative assemblies of ancient Greece and Rome, and has no precedent in the Parliamentary history of Great Britain. It may be regarded as American in its origin, and grew out of the jealous vigilance with which the smaller communities included in the Union of States sought to safeguard their political rights. The Constitution of the United States, in conferring on the Senate the power to try impeachments, provided that no conviction should be had by less than a two-thirds vote, thus securing to a minority of the States as represented in the Senate, the power to decide the result. The effect of the two-thirds provision, in the case of President Andrew Johnson, when tried on articles of impeachment, was to prevent his conviction, the vote being 35 senators for conviction and 19 for acquittal. A change of one vote would have carried conviction, and although public feeling ran high at the time, some senators who voted against the President expressed themselves in subsequent years as gratified with the result. In this case the two-thirds rule had exactly the effect intended by the framers of the Constitution. A similar rule regarding trials of impeachment has been adopted in State constitutions. The Constitution of the United States also provides that in the event of a veto by the President of any measure which has passed Congress, an affirmative vote of two-thirds shall be necessary to enact the measure into law, and such vote must be taken by yeas and nays, and the names of

the persons voting entered on the journal of each house respectively. This rule has also been adopted in the States in which governors possess the power of veto.

The two-thirds rule is best known through its adoption and political effect in national conventions of the Democratic party held for the nomination of candidates for President and Vice-President of the United States. It was adopted in the first Democratic National Convention, held in the city of Baltimore, 21 May 1832, when the Committee on Rules reported the following resolution:

«Resolved, that each State shall be entitled, in the nomination to be made of a candidate for the Vice-Presidency, to a number of votes equal to the number to which they will be entitled in the electoral colleges under the new apportionment in voting for President and Vice-President, and that two-thirds of the whole number of votes in the convention shall be necessary to constitute a choice.»

The rule applied only to the nomination for Vice-President for the reason that there was no difference of view as to the nomination for President, Andrew Jackson being the unanimous choice for the latter office, while there were several candidates for the Vice-Presidency. Martin Van Buren was nominated for Vice-President under the two-thirds rule, and was elected to preside over the very body which, by the casting-vote of John C. Calhoun, the former Vice-President, had rejected his nomination as Minister to England.

In the Democratic National Convention of 1836 no reference was made to the two-thirds rule. Martin Van Buren was nominated for President without opposition and Richard M. Johnson received more than a two-thirds vote on the first ballot for Vice-President. In 1840 Van Buren and Johnson were again made the candidates of their party, without any necessity for invoking the two-thirds rule. They were defeated in the election by Harrison and Tyler.

In the Democratic National Convention of 1844 the two-thirds rule was reaffirmed, and made to apply to both President and Vice-President. Van Buren had a majority of votes for the Presidential nomination, but less than two-thirds, and he maintained this majority on the first eight ballots. Opposition to him was strong, however, and on the ninth ballot James K. Polk, of Tennessee, who had not received a vote until the eighth ballot, received the entire vote of the convention. He had not even been a candidate for the nomination, and his name had not been put formally before the convention, when its members agreed, in view of the opposition to Van Buren, to make him their nominee. The supporters of Van Buren had apprehended from the first that the adoption of the two-thirds rule would involve his defeat, and they opposed it strenuously, the debate on the question lasting a day and a half. Since its adoption in 1844 it has never been disputed in Democratic National Conventions. The convention of 1848, which spent three days in organizing, followed the rule, and it was again reaffirmed in 1852 when Lewis Cass, the leading candidate, was defeated, and Franklin Pierce nominated on the 49th ballot. Cass had a majority on many ballots, but did not command the necessary two-thirds, while Pierce did not receive a vote until the 40th ballot. In the convention of 1856 James Buchanan had a majority for President early in the balloting, but did not receive the necessary two-thirds until 17 ballots had been taken.

The Democratic National Convention which met in Charleston, S. C., 23 April 1860, was the most exciting ever held in the history of the party, and the enforcement of the two-thirds rule in that body may be said to have indirectly brought about the Civil War. The convention was in session for 10 days, and took 57 ballots without making a nomination. Stephen A. Douglas had a majority over all on all ballots, but could not obtain the necessary two-thirds. There were 303 votes in the convention, and 202 were necessary to a choice. The convention adjourned to Baltimore, and there the party divided on the issues which brought about the conflict between North and South in the following year. It is generally agreed that Douglas, if nominated at Charleston, and supported by the whole strength of his party, would have been elected, and civil war avoided. That this would probably have been the result is indicated by the fact that Abraham Lincoln, the Republican candidate, received a popular vote of 1,866,152, against a popular Democratic vote of 1,375,157 for Douglas and 847,953 for Breckenridge, indicating a large popular majority, and electoral majority also, for the Democratic candidates, had the party been united. In subsequent Democratic conventions the two-thirds rule has been adhered to, but at various times its repeal has been earnestly urged by many Democratic party leaders and newspapers.

TWO-WIRE SYSTEM. See ELECTRICAL TERMS.

TWO YEARS BEFORE THE MAST, by Richard Henry Dana, Jr., is a truthful narrative that has all the fascination of fiction. When the author was advised to try a sea voyage for his health, which had become impaired during his student days at Harvard, he rejected the conventional pleasure trip to Europe, and shipped as a common sailor on a vessel bound from Boston around Cape Horn to what is now California and Oregon. Gold was not yet discovered, and the cargo chiefly sought was hides. On his return he published, in 1840, the account of his experiences which has become an American classic. It gives an admirably vivid account of life on a sailing vessel in the days when the old American merchant marine was at its best, and it shows glimpses of the Pacific Coast that are interesting in view of later historical developments. Young Dana was not only a close observer but a «good mixer.» His descriptions of ocean storms, of the wild scenery around the Cape, of the coast country, of the details of navigation and the stowing of cargo are supplemented by sympathetic and very real portrayals of his shipmates during the long cruise. Though he did not write for the sake of effecting reforms, his recital of unnecessary hardships and abuses to which the crew were subjected attracted public attention, and had a salutary effect. His style is not ambitious, but is apt, direct and admirably suited to his material. It may have been this lack of apparent effort that made publishers slow to accept the work. The manuscript is said to have brought the author but a

nominal sum, but the merits of the book were promptly recognized as soon as it was published, both in England and in America. While by no means a "juvenile" it is a narrative of unfailing interest for boys. A later edition, published in 1869, contains an added chapter which gives an account of a later trip to California; this is of both comparative and biographical interest. Handsomely illustrated editions of the work have been published in recent years.

WILLIAM B. CAIRNS.

TWOMBLY, Alexander Stevenson, American Congregational clergyman and author: b. Boston, 14 March 1832; d. Newton, Mass., 19 Nov. 1907. He was graduated at Yale in 1854 and at the Andover Theological Seminary in 1858. From 1859 to 1872 he held pastorates in Cherry Valley, N. Y., Albany, N. Y., and Stamford, Conn. He also served as chaplain in the Army of the Potomac. In 1896 he retired from the ministry and devoted himself to literary work. He wrote 'The Choir Boy of York Cathedral' (1890); 'Masterpieces of Michelangelo and Milton' (1896), and 'Hawaii and Its People' (1900). He also edited the silver series of 'English Classics.'

TYAN-SHAN, tē-ān'shān', **THIAN-SHAN,** or **CELESTIAL MOUNTAINS,** central Asia, a range of mountains running in an easterly direction from the Pamir plateau along the northern boundary of the Tarim Basin (East Turkestan) into southern Mongolia. In the east it forms a more or less connected ridge, but toward its western extremity it spreads out, fan-like, into a number of diverging ranges. The highest point, situated near the western end, is Tengri Khan, with an altitude of little over 24,000 feet. See HIMALAYA.

TYBEE, tī-bē', an island in Chatham County, Ga., at the mouth of the Savannah River. It is about six miles long and three miles wide. The waters surrounding it are on the north Tybee Roads, on the east the Atlantic, on the south Tybee Creek and on the west Lazaretto Creek. The Tybee lighthouse is on the northeastern end; it is 144 feet high; the white dioptric light is 150 feet above the water and is visible 18 nautical miles. The lighthouse is in lat. 32° 1′ 20″ N., long. 80° 50′ 31″ W. In the Civil War it was occupied by the United States forces, under command of Brigadier-General Sherman, 28 Nov. 1861 and batteries were subsequently erected on it and the adjacent islands, for the reduction of Fort Pulaski at the mouth of the Savannah River, commanded by Colonel Olmstead of the Confederate army. The bombardment began on the morning of 10 April 1862 from 11 batteries, between 1,500 and 3,000 yards from the fort, mounting 20 guns and 16 mortars, and the fort capitulated at 2 o'clock the next afternoon.

TYCHO BRAHE, tī'kō brā'ĕ. See BRAHE, TYCHO.

TYCOON, or **TAIKUN,** tī-koon', a Chinese word meaning "great prince." The title was formerly conferred by foreigners on the shogun or commander-in-chief of the Japanese army.

TYLER, Bennet, American clergyman: b. Middlebury, Conn., 10 July 1783; d. South Windsor, Conn., 14 May 1858. He was graduated at Yale (1804), was pastor of the Congregational church in South Britain, Conn. (1808–22), president of Dartmouth College (1822–28) and pastor of the Second Congregational Church, Portland, Me. (1828–33). He became professor of Christian theology in the seminary at East Windham (1833) and remained there until the day of his death. His 'Lectures on Theology' was published after his death by Rev. Dr. Gale, his son-in-law (Boston 1859). Consult Walker, W., 'New England Leaders' (New York 1901).

TYLER, Charles Mellen, American educator: b. Limington, Me., 1832. He was graduated at Yale in 1855 and later attended the divinity school there. He was ordained in the Congregational Church in 1857 and served as captain of volunteers during the Civil War. At its close he became pastor of the South Congregational Church, Chicago, and in 1873 he was called to the First Congregational Church of Ithaca, N. Y., where he remained till 1892, when he resigned to accept the appointment of Sage professor of history and philosophy of religion and Christian ethics at Cornell University, becoming professor emeritus in 1903. After 1907 he served as trustee of Cornell University. He published 'Bases of Christian Belief'; 'Life of George Wolcott, U. S. V.,' and last chapter of Pfleiderer's 'Geschichte der Religious Philosophie' and various articles in papers and magazines.

TYLER, Daniel, American soldier: b. Brooklyn, Conn., 7 Jan. 1799; d. New York, 30 Nov. 1882. He was graduated from West Point in 1819, served on garrison duty in New England in 1819–24 and was on duty in France in 1828–29 preparing a comprehensive work on 'Manœuvres of Artillery' and securing drawings and designs afterward used in modeling the United States artillery equipment. In 1834 he resigned from the army and was occupied as a railway constructing engineer and railroad president until the outbreak of the Civil War. He was appointed colonel and later brigadier-general of volunteers in 1861 and was in command of a division at Blackburn's Ford and at the first battle of Bull Run. He was mustered out of service 11 Aug. 1861, but was reappointed brigadier-general of volunteers 13 March 1862 and assigned to the Army of the Mississippi. He participated in the siege of Corinth, April–June 1862, and in June 1863 was in command at Harper's Ferry and Maryland Heights. In April 1864 he resigned his commission and subsequently established large cotton and iron industries in Alabama, was president of the Mobile and Montgomery Railroad in 1873–79 and also founded the town of Anniston, Ala.

TYLER, James Gale, American marine artist: b. Oswego, N. Y., 15 Feb. 1855. He was educated in the public schools of Oswego, N. Y., until 1870; studied for marine artist with A. Cary Smith, naval architect. He is represented in the collections of T. B. Clark, James Gordon Bennett, Catalin Lambert, A. K. Bolan, W. M. K. Alcott and many others. Among his most important pictures are 'The Half Moon'; 'The New World'; 'Norman's Woe'; 'Towing In the Prize'; 'Under Steerage'; 'Fortunes

of War'; 'The Mad Atlantic'; 'First American Shipwreck'; 'Flying Dutchman'; 'Abandoning the Jeannette,' etc. He has contributed illustrations and marine art studies to *Harper's, The Century, Truth* and other magazines.

TYLER, John, 10th President of the United States: b. Greenway, Charles City County, Va., 29 March 1790; d. Richmond, Va., 18 Jan. 1862. He was the second son of John Tyler, governor of Virginia (1808–11) and United States district judge (1812–13), and Mary Armistead, the only daughter and heiress of Robert Armistead. In early youth Tyler attended the school kept by Mr. McMurdo, a tyrannical Scotchman. Young Tyler at the age of 11 showed his independence and courage by crushing the autocratic schoolmaster's authority. In 1802 Tyler entered the grammar school of the College of William and Mary at Williamsburg, where he displayed an especial fondness for ancient history, Shakespeare's poetry and music. In 1807 he was graduated, and two years later was admitted to the bar. He was elected in 1811 to the State legislature, where he became a firm supporter of President Madison's war policy. One of his earliest public acts in this session occurred in connection with the United States Bank. The recharter of the bank was then before Congress and the Virginia assembly, in which State the bank was unpopular, instructed their senators, Richard Brent and William B. Giles, to vote against the recharter. Brent, however, voted in favor of the recharter and Giles voted in the negative, though contrary to his opinion and under protest. Accordingly, on 14 Jan. 1812, Tyler introduced resolutions of censure upon the course of the senators, asserting the Virginia doctrines as to the bank and the right of instruction. On 20 March 1813, Tyler married Letitia, daughter of Robert Christian. Her health was delicate. She died shortly after he became President. In 1844 Tyler married Miss Julia Gardiner. During the War of 1812 Tyler was called into the field at the head of a company of militia in defense of Richmond, then threatened by the British. From 1811 to November 1816 he served in the State legislature, when he was chosen to fill a vacancy in the House of Representatives. Here he became conspicuous as a strict constructionist Republican and States-Right advocate. He consistently opposed Calhoun's bill in favor of internal improvements, Clay's proposal for the recognition of the independence of the revolting Spanish-American colonies, a national bankrupt law, increased tariff duties and a bill for changing the per diem allowance of members of Congress to an annual salary of $1,500. He condemned, as arbitrary and insubordinate, the conduct of General Jackson in Florida, and delivered an elaborate speech against the national bank. In the 16th Congress, Tyler opposed the passage of the Missouri Compromise on the ground that Congress had no power to legislate for or against slavery in any Territory. In 1821 he declined re-election and retired to private life; but in 1823 he was again elected to the Virginia legislature. From 1825 to 1827 he served as governor of the State, when in the latter year he was elected United States senator to succeed John Randolph. In the Senate Tyler maintained an independent attitude although adhering to his strict constructionist principles. He voted against the "tariff of abominations" because he believed it was unconstitutional, and after taking part in the Virginia Constitutional Convention of 1829–30 he returned to the Senate, where he found himself first drawn to Jackson by the latter's veto of the Maysville turnpike bill. However, he displayed his independence by attacking Jackson's Turkish policy; approving Van Buren's appointment as Minister to Great Britain; supporting Jackson in the election of 1832 as the least "objectional candidate"; condemning South Carolina's nullification doctrines, while objecting to Jackson's proclamation of 10 Dec. 1832. The compromise tariff of 1833 caused by South Carolina's attitude was earnestly supported by Tyler; but on the "Force Bill," allowing the President extraordinary powers for the collection of duties, he was the only senator to vote in the negative. With the opening of Jackson's war on the United States Bank, Tyler broke with the administration and began to associate more closely with the opposition soon to be designated as the "Whigs." Tyler saw in the unbridled democracy of Jackson a tendency toward despotism "under the leadership of a headstrong and popular chief" and to him the "only safeguard for constitutional government lay in strict construction." Thus in the controversy over the removal of deposits from the United States Bank and with regard to Clay's resolution censuring Jackson for his course in this matter, Tyler voted with Clay and the bank men. In the election of 1836 Tyler was nominated by the "States-Rights-Whigs" for the Vice-Presidency on the ticket with Hugh L. White of Tennessee, and received 47 votes. Tyler's hostility to the Jackson party was emphasized when he resigned his seat because he could not conscientiously obey the instructions of the Democratic legislature of Virginia to vote in favor of Benton's resolution expunging from the Senate Journal the previous vote of censure. In January 1838 he was chosen president of the Virginia Colonization Society, and in the spring of the same year was returned to the Virginia legislature. The following year he made an unsuccessful attempt for the United States senatorship. The Whig Convention of 1839 nominated General Harrison for the Presidency in order to secure the votes of the anti-Masons and National Republicans, whom Clay had alienated, and Tyler was chosen as his running mate in order to obtain the votes of those Democrats who were dissatisfied with the administration. In the whirlwind campaign that followed Harrison and Tyler each secured 234 electoral votes and were elected. Harrison died one month after his inauguration and Tyler succeeded to his office. Immediately the President found himself in a conflict with Congress over the attempt to re-establish a national bank. Tyler had always held that Congress could not create a corporation within the State without the consent of the State. Therefore, Tyler vetoed the two bills presented to him as not incorporating his ideas, and after the second veto all the Cabinet members, except Webster, who was then negotiating the Webster-Ashburton Treaty, resigned. Thenceforth through-

out his administration Tyler was a President without a party and in constant strife with Congress. At the close of his term Texas was annexed, and this seemed to commend him for re-election; but in August 1844, after having been nominated at an irregular Democratic convention at Baltimore in May, Tyler withdrew from the race. From then until the Civil War Tyler held no public office, but when South Carolina adopted its ordinance of secession Tyler came forth as an advocate of peace and was chosen president of the Peace Convention which met in Washington, 4 Feb. 1861. Seeing the futility in getting Congress to accept the Peace Conventions resolutions, Tyler advocated the immediate secession of Virginia. In May 1861 he was elected a member of the provisional Congress of the Confederate States, and the following autumn was elected to the permanent Congress, but died before taking his seat. Consult Tyler, L. G., 'The Letters and Times of the Tylers' (3 vols., Richmond 1884), and Wise, H. A., 'Seven Decades of the Union' (Philadelphia 1872); Wilson, J. G., 'Presidents of the United States' (Vol. II, New York 1914).

R. C. McGRANE,
Assistant Professor of History, University of Cincinnati.

TYLER, John Mason, American biologist: b. Amherst, Mass., 18 May 1851. He was educated at Amherst (1873), received his A.M. degree there (1876), was at Union Theological Seminary (1874–76) and at Göttingen and Leipzig (1876–79). He was instructor in biology in Amherst (1879–81), and Stone professor in biology in that college since 1882. Among his publications are 'Man in the Light of Evolution' (1908), and 'Place of the Church in Evolution' (1914).

TYLER, Lyon Gardiner, American educator: b. Sherwood Forest, Va., August 1853. He is the son of President Tyler, and was graduated at the University of Virginia in 1875. In 1877 he became professor of *belles-lettres* at the College of William and Mary. In 1882–88 he practised law in Richmond, Va., and in 1888 was called to the presidency of the College of William and Mary. He has published 'The Letters and Times of the Tylers' (1884–85); 'Parties and Patronage in the United States' (1890); 'The Cradle of the Republic' (1900; 2d ed., 1906); 'England in America' (1904); 'Williamsburg, the Old Colonial Capital' (1907); 'The Cavalier in America' (1913). He edited 'Narrative of Early Virginia, 1606–1625' (1907); 'Men of Mark in Virginia' (5 vols.); 'Biographical Dictionary of Virginia' (5 vols., 1915).

TYLER, Moses Coit, American historian and scholar: b. Griswold, Conn., 2 Aug. 1835; d. Ithaca, N. Y., 28 Dec. 1900. He was graduated from Yale in 1857; later studied theology there and at Andover, and was pastor of the First Congregational Church, Poughkeepsie, N. Y., 1860–62. He was professor of English literature in the University of Michigan, 1867–81; literary editor of the *Christian Union* in 1872–74, and in 1881 was appointed professor of American history in Cornell University, which position he occupied at the time of his death. He was ordained deacon in the Protestant Episcopal Church in 1881 and priest in 1883. He published 'The Brawnville Papers' (1869); 'A History of American Literature During the Colonial Period' (1878); 'Manual of English Literature' (1879); 'Life of Patrick Henry' (1887); 'Three Men of Letters' (1894); 'The Literary History of the American Revolution' (1896). His 'History of American Literature' is a work of great literary charm and the most thorough scholarship. Consult Burr, G. L. (in 'Report' of the American Historical Association, Vol. I, New York 1901); Austen, J. T. (ed.), 'Moses Coit Tyler: Selections from his Letters and Diaries' (Garden City, N. Y., 1911); Trent, W. P. (in *The Forum,* New York, August 1901).

TYLER, Robert Ogden, American soldier: b. Greene County, N. Y., 22 Dec. 1831; d. Boston, 1 Dec. 1874. He was graduated at West Point in 1853, and until the outbreak of the Civil War served on frontier duty in the West. In April 1861 he accompanied an expedition for the relief of Fort Sumter. In May he was made assistant quartermaster with the rank of captain, and in September was appointed colonel of the Fourth Connecticut Volunteers (afterward First Connecticut Heavy Artillery), with which he served until the spring of 1862 in the defenses of Washington. He was conspicuously active in the Peninsula campaign of 1862, participating in its principal battles, and in November was promoted brigadier-general of volunteers. At Fredericksburg he commanded the artillery of the centre ground division. In recognition of his bravery in that action he was brevetted major in the regular army. He distinguished himself in the battles of Chancellorsville, Gettysburg and Spottsylvania; and was placed in command of the artillery reserve in the Army of the Potomac in November 1863. During the Spottsylvania action he repulsed an attack of Ewell's corps, and for this "gallant conduct and brilliant success" he and his men were publicly thanked by General Meade. He led a brigade at Cold Harbor, and there received a wound which maimed him for life and permanently broke his health. At the close of the war he was brevetted major-general in both the volunteer and regular armies.

TYLER, Royall, American jurist and author: b. Boston, Mass., 18 July 1757; d. Brattleboro, Vt., 16 Aug. 1826. In 1776 he was graduated at Harvard. He studied law under John Adams, was aide to General Lincoln for a short time in the Revolutionary War and afterward in Shays' Rebellion of 1786. He engaged in law practice at Guilford, Vt., in 1790, became judge of the Vermont Supreme Court in 1794 and in 1800–06 was chief justice. 'Reports of Cases in the Supreme Court of Vermont' (2 vols., 1809) constitute his only legal publication, but as a dramatist and a humorous writer he attained a considerable reputation. He was one of the first successful American playwrights, his plays including 'The Contrast' (1786); 'May-Day' (1787); 'The Georgia Spec' (1797), etc. He was a contributor of humorous prose and verse to the leading periodicals of his day, and also published 'The Algerine Captive' (1797); 'Moral Tales for American Youths' (1800); 'The Yankey in London' (1809), etc. 'The Contrast'

was republished in 1887 by the Dunlap Society. Some of Tyler's work appeared in *The Farmer's Museum* and *The Portfolio* of Joseph Dennie.

TYLER, Wat, English social reformer: b. Colchester, Essex; d. London, 1381. Nothing is known of his antecedents. There was serious cause for the rebellion which he headed, but like men of other ages he had ideas beyond his time, which he had imbibed from the teaching of a priest, John Ball (q.v.). The insurgents demanded the abolition of serfdom and the poll-tax, a maximum rent of four pence per acre for all lands freed from monastic or monarchial control, the right to buy and sell free from toll all over England, the abolition of the statutes of labor which favored landlords and master-craftsmen at the expense of the workingmen. There seems to have been a general spirit of discontent against all vested interests pervading the lower classes at the accession of Richard II—city corporations, monastic landholders, chartered corporations of all sorts. The young king paltered with Tyler and made promises which he afterward broke and the rebel leader was stabbed to death by Walworthe, mayor of London. This insurrection is an interesting incident in the history of the English people and cannot be treated as cavalierly as it used to be until about the middle of the 19th century when English historians began to apply themselves seriously to a study of their country's history as illustrated by original documents. Froissart and Walsingham deal unkindly and unfairly with Tyler, as might be expected since he opposed the clerics. Consult Trevelyan, 'England in the Age of Wycliffe' (1899); Powell, 'The Rising in East Anglia in 1381' (1896); Réville, 'Soulévement des travailleurs d'Angleterre en 1381' (Paris 1898); Hunt, W., and Poole, R. L., 'The Political History of England' (Vol. IV, London 1906); Oman, C., 'The Great Revolt of 1381' (Oxford 1906); Kriehm, George (in *American Historical Review,* Vol. VII, New York 1902).

TYLER, Tex., city, county-seat of Smith County, on the International and Great Northern, the Saint Louis Southwestern railroads, also a branch to Lufkin in Angelina County; about 95 miles east by south of Dallas. The city is on the highest point of land between the Gulf of Mexico and the Red River and is in a fertile agricultural region. The chief manufacturing establishments are a box factory, brick works, pottery, canning factory, ice factory, oil mills, mattress and overall factory, "Cotton Belt" railroad shops, general offices, waterworks, electric-light plant, telephone works. The last census reported 20 industrial establishments, employing 592 persons, with a capital of $686,000 invested, paying $391,000 in services, $449,000 for raw materials and turning out products valued at $897,000. The shipments are chiefly cotton, corn, fruits, vegetables, hay and livestock. There are several churches. The educational institutions are Tyler College, Tyler High School, Hubbard, Marsh and Douglas public schools, two public schools for colored pupils and East Texas College for colored pupils. The four banks have a combined capital of $600,000. and the average annual amount of business is $50,000,000. The government is of the commission form since 1914. Tyler was settled in 1846, incorporated the same year and chartered as a city in 1875. Pop. 11,629.

TYLOPODA, a group of ungulate mammals, containing the camels and llamas, an ancient group characterized especially by the structure of the feet, in which no traces of the second and fifth toes remain, and the fused metacarpals and metatarsals diverge somewhat at the distal ends. The tread is formed by solepads. Singular peculiarities are the elliptical shape of the blood corpuscles and the character of the rumen-chamber of the stomach. See CAMELIDÆ.

TYLOR, tī'lôr, **Sir Edward Burnett,** English anthropologist: b. Camberwell, London, 2 Oct. 1832; d. 2 Jan. 1917. He was educated at the Friends' School, Tottenham, and in 1856 accompanied the ethnologist Henry Christy on a scientific journey through Mexico, one result of which was his 'Anahuac or Mexico and the Mexicans' (1861). He was appointed keeper of the Oxford University Museum in 1883 and became professor of anthropology there in 1895. He was knighted in 1912. In 1888 he was Gifford lecturer at Aberdeen and became president of the Anthropological Society in 1891. He has published in addition to the work already named 'Researches Into the Early History of Mankind' (1865); 'Primitive Culture' (1871; 3d ed., 1891); 'Anthropology' (1881); 'The Natural History Religion' (1900). His works gave a great impetus to anthropological science. Tylor is perhaps best remembered for his statement and development of the proposition that animism is an unusual factor in primitive religion.

TYMPANUM. See EAR.

TYNAN, Katherine. See HINKSON, KATHERINE TYNAN.

TYNDALE, tĭn'dąl, **Hector,** American soldier: b. Philadelphia, 24 March 1821; d. there, 19 March 1880. He was engaged in business in his native city during the events just preceding the Civil War. With John Brown and his raid in Virginia he had no connection; but on the last visit of Mrs. Brown to her husband Tyndale consented, at the risk of his life, to act as her escort, a duty which, in the face of insult and violence, he unflinchingly performed. At the outbreak of the war he was in Europe, but at once returned and entered the army as major of the 28th Pennsylvania regiment. In April 1862 he was promoted lieutenant-colonel. At Antietam he commanded a brigade, with which he three times repulsed Confederate assaults. Early in the day he was badly wounded, but remained on the field for hours, being finally carried, with a second wound, to the rear. In November 1862 he was made brigadier-general of volunteers for gallantry in that battle. At Wauhatchie by a bayonet charge he captured a hill which was later named Tyndale's Hill. He also took part in a number of battles around Chattanooga. In 1865 he was brevetted major-general. He was a Republican nominee for mayor of Philadelphia in 1868, and was defeated by only 68 votes out of more than 120,000.

TYNDALE, William. See TINDALL, WILLIAM.

TYNDALL, tĭn'dąl, **John,** British physicist: b. Leighlin Bridge, County Carlow, Ireland,

21 Aug. 1820; d. Haslemere, Surrey, 4 Dec. 1893. After secondary schooling he joined the Ordnance Survey, with which he was connected for five years. He was then engaged in railway work, and in 1847 became a teacher of physics at Queenwood College, Hants. After studying in Berlin and becoming acquainted with Faraday, Huxley and other eminent men, he was appointed professor of physics in the Royal Institution, London, with which he continued to be connected till his retirement in 1887. Tyndall did a vast amount of valuable work by original investigation in various branches of science, especially magnetism, electricity, heat, light and sound, on which he published many papers and several well-known volumes. Among these are 'Notes of a Course of Nine Lectures on Light' (1870); 'Notes of a Course of Seven Lectures on Electrical Phenomena' (1870); 'Contributions to Molecular Physics in the Domain of Radiant Heat' (1872); 'On the Transmission of Sound by the Atmosphere' (1874); 'Free Molecules and Radiant Heat' ('Philosophical Transactions,' 1882). He made, also, studies of glacial phenomena. In 1872–73 he lectured in the United States, and in 1873 published 'Six Lectures on Light, Delivered in America.' He was president of the British Association meeting at Belfast in 1874 and delivered an eloquent address, which, by its materialistic tendency, aroused much controversy. He was the recipient of numerous honors from learned bodies at home and abroad, and many of his books were translated. His ability as a speaker fitted him to be a popular expounder of complicated problems in modern physical science.

TYNE, tīn, England, a northern river formed by the junction of the North and South Tyne, rising in Northumberland and Cumberland counties. As a united river it flows by Newcastle and empties into the North Sea at Tynemouth, after a course of 120 miles. It is partly tidal and belongs to the richest coal region of England. Its principal tributaries are the Derwent and Team. The chief towns are Corbridge, Ovingham, Newburn, Newcastle, Gateshead, Jarrow, Tynemouth, North and South Shields (qq.v.). It is navigable above Newcastle. Ship-building is important, and the Tyne is celebrated for its boat races. Many manufactures are carried on along its banks. Many improvements have been made by the building of long piers and the deepening of the channel, giving an impetus to trade. Consult Guthrie, 'The River Tyne' (Newcastle 1880), and Palmer, 'The Tyne and its Tributaries' (London 1881).

TYNEMOUTH, tīn'mŭth or tīn'mŭth, England, a municipal and Parliamentary borough in Northumberland, at the mouth of the Tyne on its north bank about eight miles east of Newcastle. It is a favorite watering-place and a fine promenade, park and winter garden have been laid out along the beach. There are many handsome buildings in the town, including Tynemouth Palace and a picturesque old priory, the Master Mariners' Asylum, aquarium, assembly-rooms, etc. The borough includes the towns of North Shields, Chirton, Cullercoats and Preston. The clearings at the port amount to 1,500,000 tons annually and there is a large export trade in coal and coke. Pop. 58,800. Consult Adamson, 'Tynemouth Priory and Castle' (in Archæologia Ælina, Vol. XXIII, London 1901).

TYNER, tī'nėr, **James Noble**, American lawyer: b. Brookville, Ind., 17 Jan. 1826; d. Washington, D. C., 5 Dec. 1904. He was admitted to the bar of Indiana, but later gave up his practice to enter political life. In 1869 he was elected to Congress from Indiana, and served until 1875, when he was appointed Postmaster-General. He remained in the Cabinet until 1882. In 1889 he was made assistant Attorney-General for the Post Office Department, in which capacity he served until 1893. Four years later he was reappointed to this office, but resigned in 1903.

TYNG, Stephen Higginson, American Protestant Episcopal clergyman: b. Newburyport, Mass., 1 March 1800; d. Irvington, N. Y., 4 Sept. 1885. He was graduated from Harvard in 1817, was in mercantile pursuits in 1817–19 and in 1819 began the study of theology with Bishop A. V. Griswold (q.v.). He was ordained in 1821, and was minister of Saint George's, Georgetown, D. C., in 1821–23 and of Queen Anne's parish, Prince George County, Md., in 1823–29. From 1829 to 1833 he was rector of Saint Paul's, Philadelphia, from 1833 to 1845 of the church of the Epiphany there. He held the rectorship of Saint George's, New York, from 1845 until his retirement as pastor emeritus in 1878. He was well known for his eloquence in the pulpit and on the platform. His theology was strongly evangelical, and he was a prominent opponent of ritualism in his Church. He also advocated total abstinence, and was otherwise identified with reform interests. Besides editing successively *The Episcopal Recorder, The Theological Repository* and *The Protestant Churchman*, he published several volumes, including collections of sermons and addresses and 'Recollections of England' (1847); 'Forty Years' Experience in Sunday Schools' (1860); 'The Prayer Book Illustrated by Scripture' (3 series 1863–67), and 'The Office and Duty of the Christian Pastor' (1874). Consult the 'Life' by his son, C. R. Tyng (New York 1890).

TYPE. See PRINTING.

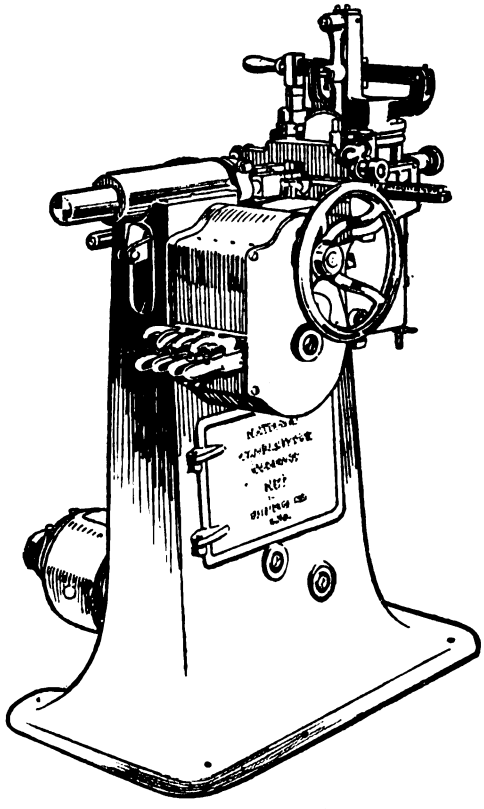
TYPE-CASTING MACHINES. Every book, news and job-printing office in former years has been absolutely dependent on the type-founder, with his elaborate plant and his established fonts of type in standard and individual copyrighted faces. The waste and wear was large and costly. Office economics compelled the use of fonts even after the faces of many of the types had become too battered for clean printing. To replace the broken and battered type it was necessary to send to the foundry for «sorts» (as the individual types are called) to fill out the fonts, and this was not only expensive but unsatisfactory, because it resulted in mixing new type with the old. The invention of the Mergenthäler Linotype machine enabled the printing offices to present absolutely clear-faced, freshly-cast body type for newspapers, books, pamphlets and the like. To a degree, also, headline type for newspapers could be economically set up and a considerable proportion of the advertising display. But there still remained a demand for movable type for hand

use. To effect the economy demanded, a small, compact machine, a sorts caster, to cast individual type of any face and size at the pleasure and convenience of each office, was devised and several different makes are now in successful operation in many newspaper, book and job-printing offices, one being the invention of J. S. Thompson, another of Hanrahan, Brown and Boydon.

The sorts caster occupies but little space — four and one-half feet high by three and one-half feet long by three feet wide. It is operated by belt and pulley and requires one-fourth horse power. Carrying to the full the newly-adopted standardization of type, one size of the machine will cast with accuracy type from 6-point up to and including 36-point, and a larger size type from 36-point to 72-point.

A very solid cast-iron frame supports the strongly made component parts — an adjustable steel mold to which is fastened the brass matrix of the desired letter; a gas-heated pot of molten type metal; a plunger rod to force accurately the exact amount of molten metal into the mold as the latter is automatically thrust forward into place, and a planer to trim the base of the type and eject it, perfect and complete, along on the delivery rod when mold and melting pot separate.

The base of the mold is stationary and permanently secured to the machine and forms with the ejector rod two sides of the mold. These are so arranged as to receive interchangeable insert mold parts to complete the exact parallelogram required by the particular face and size of the type to be cast. This insert mold part carries the brass matrix in which is cut the face of the type. Each matrix specifies the exact adjustment of blanks which the operator must make to procure the correct width or set-wise size of the character to be cast. There is an insert mold part for each body-wise size.



A Sorts Caster Machine.

A 50-pound font of 12-point type can be cast in nine hours and a font of 18-point in seven. Fonts of matrices are sold outright; distinctive designs may be cut for individual printers, or fonts may be hired as books are from a circulating library.

TYPE-COMPOSING MACHINES. See COMPOSING MACHINES.

TYPE METAL. See TYPE AND TYPE-FOUNDING.

TYPE-SETTING MACHINES. See COMPOSING MACHINES.

TYPE AND TYPE-FOUNDING. A type for printing is a letter or character in reverse, which is inked and impressed on paper to print. Type are ordinarily made of a composition of lead, tin and antimony, lead predominating. A common formula is: lead 10, antimony 4 and tin 2. The addition of antimony serves to harden the type and tin toughens it, while the proportion of the three is designed to obviate shrinkage in casting. Very large type are cut out of hard wood, with a pantagraph machine. Type are now made to a uniform height, which is a little under an inch, and are cast so exactly that thousands of them are combined in lines, pages and forms and wedged together solidly in a chase or frame and placed on the bed of a press for printing. Early printers had to cast their own type by throwing the hot molten metal into hand moulds. Hand casting was abandoned about 1845 and the Bruce type-casting machines were generally adopted in American type-foundries. These cast the type with a jet or sprue that had to be broken off, after which the type was smoothed by rubbing on a stone to remove the bur or rough edges. About 1890 automatic Barth type-casting machines came into use, delivering a completed type, and these have displaced the hand-machines. The standard machines are used to cast body type, as from 5- to 12-point. (See PRINTING for description of type sizes). There are also machines that cast job or display type and one of these also sets the type. See COMPOSING MACHINES.

Type-founding begins with designing the letters, which are drawn to a very large scale. Permanent dies are made from these drawings and these dies are used to guide the cutters of a punch-cutting machine, which form characters or letters in steel that is afterward hardened. These punches look like type but have usually a long shank. They are used to drive into softer metal to form a matrix, which matrix is later to form one end of a mold in which the type is cast. A mold of a given size may be used to cast any type of that size, if the appropriate matrix of the desired letter is introduced. The form of a matrix is that of a letter or printed character, but the type itself is a reverse form. The type proper is made rectangular and is nicked on the front

or lower side to assist the compositor in placing it in correct position. The position of the nick or number of nicks also serves to distinguish the type of different fonts of the same size. There is usually a groove across the foot to take out any irregularity in breaking off from the sprue; also a pin-mark on one side. The top or printing surface of the type is called the "face" and the beveled side of this face is the "beard," the beveling permitting easy withdrawal from the matrix. When a type-face is in high relief it is said to have a deep "counter." The horizontal hair-lines, which are conspicuous on the H, F, M, etc., are termed "serifs." A part that hangs over the body, as in some f's and j's, is a "kern." Blank types, below type high, are called "quadrats" or "quads," but when less than an n in width are termed "spaces." The "body" of a type is the size of the shank and the standard sizes are measured by "points." (See PRINTING). A point is one-seventy-second of an inch, and 12-point and "pica" are now identical. The point and the pica are the units of measurement, together with the m. This m is spelled "em" and is assumed to be square in body, as wide as it is high. One thousand ems is the unit by which type composition is paid. The price of type composition has varied all the way between 25 cents and $1 per thousand ems.

Type are made in an infinity of styles or faces, the most common of which are shown below:

This line is set in Roman.

This line is set in Roman italic.

This line is set in Old Style.

This line is set in Gothic.

This line is set in Gothic condensed.

This line is set in Antique.

This line is set in Antique expanded.

This line is set in Bold Face.

This line is set in Text.

This line is set in De Vinne.

Type that is broad for its height is termed "fat" and when narrow for its height is "lean." A font or "fount" of type is a complete assortment of one kind. As more e's are used than any other letter, these are the most numerous in a font, being followed by t, a, o, i, n, etc. An ordinary font contains capitals, lower case, figures, points, spaces and quads and some signs or reference marks, as $, &, *. It may also contain italic, small caps, fraction-marks, accented letters, logotypes, etc. The printer's case is usually made as a pair, the lower case letters, figures, points and spaces being in the lower case of the pair and the capitals and small capitals and signs, etc., in the upper case. Hence capitals are sometimes called "upper case."

The first English type-founder of ability was John Day (1522–84), who made type only for his own printing office. Benjamin Sympson (1597), of London, was the first English founder to make type for the printing trade. He was followed by John Grismand, Thomas Wright, Arthur Nichols and Alexander Fifield. Joseph Moxon was the most distinguished of the early English founders, and flourished from 1659 to 1683. He published the first book which describes type-founding, 'Mechanick Exercises' (1683), a reprint of which may be found in many large libraries. William Caslon (1692–1766), of London, was the most conspicuous founder of the 18th century and laid the designs of some of the best modern faces. After him came John Baskerville, Alexander Wilson, Thomas Cottrell, Joseph Fry, Joseph Jackson, Robert and William Martin, Vincent Figgins, William Miller, Anthony Bessemer, all of Great Britain. In the United States, Abel Buell, of Connecticut, is mentioned by De Vinne as being probably the first founder, in 1769. The early founders were also stereotypers. It was in 1772 that Christopher Sauer (or Sower) established a type-foundry at Germantown. Benjamin Franklin established his Philadelphia printing office with type bought of P. S. Fournier, the French founder who is credited with originating the point system. Later Franklin cast his own type in a small way. John Baine, of Glasgow, came to Philadelphia, in 1875, and started a foundry. Adam G. Moppa established the first foundry in New York about 1791, but later went to work for Binny and Ronaldson, who began type-founding in Philadelphia in 1796. In 1833 this was taken over by Johnson and Smith and finally became the well-known house of MacKellar, Smith and Jordan. White and Wing started in Hartford in 1804, but discontinued. White going to New York in 1810. In 1854 White and Company sold out to Farmer, Little and Company. Robert Lothian made type in a small way in New York early in the 19th century. James Conner established himself originally as a stereotyper in New York in 1827 and later took up type-founding. William Hagar's foundry was started in New York in 1840. David Bruce (1770–1857), followed by George Bruce and David Bruce, Jr., conducted a type-foundry in New York from 1806 until 1890. David Bruce, Sr., invented the "patent block" for stereotypes and David Bruce, Jr., the first real type-casting machine. James Lindsay and Peter C. Cortelyou were associated with the Bruces. Samuel N. Dickinson and Michael Dalton were the most conspicuous Boston founders in the last century. The Cincinnati type-foundry was established in 1817, the Saint Louis foundry in 1840. Faulkner and Son established a foundry in San Francisco in 1866 and Painter and Son in 1868. Collins and McLeester began in Philadelphia in 1853, Barnhart Brothers and Spindler were established in Chicago in 1878 and later in Saint Louis, Omaha, Kansas City and Saint Paul. Marder, Luse and Company started in Chicago in 1855 and later they had a foundry in San Francisco. Shraubstadter and Saint John started the Central Type Foundry in Saint Louis in 1875; the Cleveland foundry was established in 1879. The multiplication of type-foundries in the United States entailed great duplication of costs in producing new type faces. These and other conditions induced the formation in 1892 of the American Type Founders Company, which took over 23 of the leading firms and corporations in type-founding in America. This has been commonly referred to as the Type Trust, but it never monopolized the business and independent foundries have been maintained in most large cities. Early in the 20th century the widespread use of the linotype machine took away from the type-foundries a large part

of the trade that would otherwise have existed in individual type. Then the monotype and several type-casting machines came into use in large printeries, which now cast a great deal of their own type. The business of the type-foundries, thus reduced, has changed and they now handle a great variety of printers' supplies and small mechanism. Consult Pasko, 'Dictionary of American Printing' (1892); De Vinne, 'Plain Printing Types' (1900).

CHARLES H. COCHRANE,
Former Secretary, Typothetæ of New York.

TYPEE. 'Typee: a Peep at Polynesian Life,' which Herman Melville published in 1846, was the earliest notable romance dealing with the South Seas, a region abundantly exploited by romancers since. Melville had visited the Marquesas in the summer of 1842 as a sailor before the mast on the whaling-ship *Acushnet*, had escaped with a companion to the island of Nukuheva [Nukahiva], and had strayed into the cannibal valley of Typee [Taipi], where the savages held him for four months in an "indulgent captivity." Although he kept no journal and wrote nothing down for three years, he followed his memories closely; but of few writers is it more difficult to say than of Melville at what point fact shades into fiction. Merely as history 'Typee' has real value, with its sympathetic yet sharp-eyed observation of Marquesan customs and its rich descriptions. It is, however, as fiction that the book has been primarily influential and generally read, as a romance of the life led by a sophisticated man among perilous, lovely, barbaric surroundings. The valley of Taipi becomes, in Melville's handling, a region of dreams and languor which stir the senses with the fragrance and color of the landscape and the gay beauty of the brown cannibal girls, especially of Fayaway, the dainty, memorable heroine. Yet Melville, though thoroughly sensitive to the felicities of the exotic life, never loses himself in it entirely, as did later men like Lafcadio Hearn and Pierre Loti, but remains always the shrewd and smiling Yankee. (He later continued the narrative in a sequel, 'Omoo,' q.v.).

CARL VAN DOREN.

TYPEWRITER, a machine operated by means of a manual keyboard, which produces characters resembling those of ordinary letter press, as a substitute for handwriting, by the impress of type.

History.— The first successful typewriter was an American invention, and was so far perfected in the late seventies of the 19th century that many thousands were then being made to supply the demand. The archives of the British Patent Office show that in 1714 a patent for a writing machine — the first typewriter known — was applied for by Henry Mill, a London engineer. No drawing of his machine is extant, and its construction is not known. In 1784 a French invention appeared, designed to make embossed or raised characters for the blind. In 1829, W. A. Burt patented the first American machine. A French machine of 1833 was provided with the first manual keyboard. In 1843, Charles Thurber, then of Worcester, Mass., secured a patent for a typewriter, and two years later a second patent, but his machines were never perfected for practical use. About this period Sir Charles Wheatstone invented several writing machines, the models of which repose in the South Kensington Museum. The year 1855 saw the production of Foucault's writing machine for the blind. Indeed most of the efforts of early inventors were directed to producing machines for the use of the blind, and embossed characters were general.

In 1856, Alfred E. Beach, of New York, one of the proprietors of the *Scientific American*, secured a patent for a typewriter which embodied the characteristic basket-like disposition of type-bars and type used on the standard machines of to-day. The Beach machine was for printing embossed letters for the blind. Contemporaneous with this inventor, Dr. S. W. Francis, of New York, was working on the same line. He arranged his keys in a circle around the instrument, used an inking ribbon, a traveling paper-frame and an alarm-bell, rung as the end of the line was approached, thus embodying many features of present-day instruments. Thomas Hall, of New York (inventor of the Florence sewing-machine), also was experimenting on a typewriter about this time. In 1859 he learned of the prior patents and tried to purchase them. In June 1867 he obtained a patent of his own; and one of his machines, printing large and small letters, was shown at the Paris Exposition of 1867. The paper was placed on a table, which slid under the bottom of the machine. The spacing for letters varied with their thickness, thus producing work more resembling that of type than does the identically spaced typewriting of recent machines. Hall struggled against much discouragement, and never succeeded in bringing his machine into use. In 1881 he secured a patent on another type of machine, with a perforated dial-plate and rubber cylinder. It achieved a partial success, but of late years it has been turned out in cheap form as a toy. John Pratt, of Center, Ala., secured a United States patent in 1868 for what he called his Pterotype — a complicated machine which did not come into public use. This brings us to the recent history of the typewriter in which it was brought to the high degree of efficiency we witness to-day. Charles Latham Sholes, of Milwaukee, Wis., with Samuel W. Soule and Carlos Glidden, became associated: the first two were trying to construct a numbering machine and Glidden suggested developing the idea into a typewriter. After months of work Sholes left the others, and with James Densmore, of Meadville, Pa., as financial backer, pushed the invention to completion, and secured a patent in June 1868. In 1873 it was put on the market as the Sholes and Glidden typewriter. E. Remington and Sons, of Ilion, N. Y., became the manufacturers of the machine and, in 1874, 400 were sold. These early machines printed only one kind of letter so that the writing was in capitals only. The introduction of small letters occurred in 1877 and many minor improvements were added from time to time. As this machine, the first which proved a commercial success, embodies most of the fundamental elements of present-day machines, an enumeration of these will not be amiss. The Remington, as it is now known, is characterized by the "shift," by which the

same keys print large or small letters as desired. The radial type-bars, forming when at rest a sort of basket, form another common feature. On the top of the frame is a roller covered with India-rubber; and by its side and parallel, a smaller roller. Between these the top edge of a sheet of paper is inserted, and brought into proper position to receive the first line of "writing." Immediately in front of the rubber cylinder (in the "visible writers"), beneath (in the "invisible writers"), and in line with its axis, is the ink-ribbon; and in front of the ribbon at a point in the centre every letter is made to appear in succession to do the writing. The ink-ribbon is automatically raised in front of the type-bar when a key is depressed, and falls back to its original position as the bar recedes, this permitting the typist to see the impression on the paper. During operation the ribbon is gradually unwound from a spool or holder at one side of the machine on to another at the opposite side; the movement of the ribbon may be reversed at will. The carriage with the platen moves along one space to the left as each key is released. This movement and stoppage is regulated by a coiled spring and strap, and a ratchet escapement. For tabulation special column stops are set at the desired distance and upon depressing the tabulár key the carriage advances to the left until the next column stop is reached. The types are usually of steel or some hard alloy and are fixed in the ends of a series of levers, each lever having its fulcrum at a point in the circumference of the central opening. The key for forming the spaces between the words extends nearly the whole length of the keyboard, so that it can be readily worked, no matter in what position the hands may be at the close of every word. The depression of each key causes the letter with which it is connected to strike the ink-ribbon, thereby transferring the form of the letter to the paper. On removal of the pressure, the type descends by its own gravity.

The Caligraph, invented and developed by George W. N. Yost, uses no shift, but has a separate key for each character. In February 1880 a patent for a typewriter was granted James B. Hammond, of New York. The type-faces were carried on the periphery of sectors of circles. These were slipped on a vertical pin and rotated around it. Three such sectors gave three sets of types, thrown into action by two "shifts." Instead of striking the type against the ribbon and paper, a hammer gave the paper a blow from the back against the ribbon and type-face. The force of the blow came from a spring, so that an even force was always secured. Other classes of machines have no ribbon, but use an inking pad. Of these the Yost was the most successful. In 1889 arrived the Smith-Premier machine — a double keyboard type-bar machine. It made use of a tri-colored ink-ribbon. The Blickensderfer machine of the type-wheel class entered the field in 1892 and attained great popularity. After a period its backers put out an electric machine which rendered operation very easy. From 1890 to 1905 over 100 new machines were brought out, but few had any distinguishing merit and after a brief career the market was left to the older and standard machines. An exception to this was the Underwood machine of the type-bar class, a "visible" writer from the start. This machine is a great favorite with typists because of the ease of manipulation and the high quality of the work. The L. C. Smith machine also proved of enduring quality. Ball-bearings were used to secure smoothness and ease in running. Other more or less successful machines are the Oliver, Royal and Monarch. The Oliver can scarcely be called a "visible writer" since only one-third of the line of writing can be seen. This machine has a "double shift" system for which the advantage is claimed that a smaller and simpler keyboard is rendered possible thereby.

Within recent years writing-machines have been developed for writing on flat cardboards, on a book such as a ledger, to make out bills, tabulate, discount and add several columns of figures. The Elliott-Fisher, the earliest and one of the best of these machines, has a flat platen, about which the machine proper may be moved up or down, right or left, etc. Bookkeeping and adding typewriters have also been put on the market by the makers of standard writing-machines such as the Remington and Underwood companies. They have done much to remove the drudgery from bookkeeping and accounting.

The typewriter became a favorite soon after its introduction in the seventies. It is now regarded as an essential part of all office equipment and even in the home it is coming into general use. Portable machines of excellent quality have made it available for travelers, army officers in the field, etc. Magazines and other periodicals are practically a unit in demanding typewritten "copy" from their correspondents and contributors, because of its greater legibility. As regards speed, a rate of 60 words a minute is good ordinary work and is about three times faster than a good penman, a rate of 80–90 words is fast average, while 100 words or over per minute is considered very fast. The record in competition is 143 words per minute. A recent invention is a typewriter with telegraphic attachment, which makes it possible for an operator to type a message, for instance, in Montreal, and a receiving machine in New York prints the message on a paper after the manner of the ordinary machine. The Patent Office reported on 9 Oct. 1919 that it had issued approximately 7,006 patents covering typewriting machines.

Statistics.— Too frequently official statistics include the incidentals under "Typewriters and Supplies." Below are the latest available figures:

Year	Establishments	Typewriters and supplies value
1914	107	$30,988,000
1909	89	26,309,000
1904	66	16,642,000
1899	47	8,400,000
1889	30	1,422,000

These establishments or factories were located in the States as follows: Connecticut,

7; New Jersey, 8; New York, 61; other States, 31. In the year 1914 typewriter machines were being produced in 50 establishments with an invested capital of $27,635,000, with an output valued at $19,851,000 and giving employment to 12,654 wage-earners. The following are the export values of typewriters in recent years: 1908, $6,495,756; 1909, $6,899,069; 1910, $8,239,510; 1911, $9,778,498; 1912, $11,423,691; 1913, $11,532,364; 1914, $10,575,573; 1915, $5,315,134; 1916, $9,104,189; 1917, $11,162,423; 1918 $7,480,714. The sudden fall in exports after 1914 is, of course, a reflection of the war cutting off Europe from the American product as well as shortage of ships and contracted credits in neutral countries.

TYPHA, the cat-tails or bulrushes, a genus of perennials growing in swamps, the somewhat sword-shaped bases of the leaves often submerged. The leaves of *T. latifolia* are radical, long and linear; the flowers are monœcious in a cylindrical spike, terminating a tall stem and subtended by fugacious bracts. The perianth consists of bristles, with stamens or ovary according to sex; the staminate flowers are at the apex of the stem and after pollinating gradually disappear, leaving the lower fertile ones to mature their fruits. When ripe, these fruits form decorative cylindrical masses, of a handsome seal-brown color, at the level of, or a little higher than, the tops of the leaves. During the winter these spikes disintegrate and the nut-like fruits float away, supported by the white hairs expanding at their bases. The smaller species (*T. angustifolia*) has spikes in which the staminate and pistillate portions are slightly separated. Both are widely distributed. As is the case also with the western American species, the abundant mealy pollen of *T. elephantina,* or elephant-grass, serves for bread in India and New Zealand and also as a substitute for matches and tinder, since it is very inflammable. The plant is a favorite food of elephants. *Typha* rhizomes abound in starch and when rid of their acridity become a food of various peoples; they have also been employed as an astringent and diuretic drug, and the down of the fruits serves as a dressing for wounds and for upholstering purposes. See BULRUSH; TULE.

TYPHOID BACILLUS. This bacillus, the cause of typhoid fever, was first discovered by Eberth in 1880. He found it in the glands of the mesentery and in the spleen. It was not until 1884, however, that Gaffky obtained the organism in pure culture. He first used a potato culture-medium and was fortunate in obtaining the organism, for since its discovery it is becoming more and more evident that the typhoid bacillus is very closely allied to a great variety of other forms and it is now necessary to use a very complicated technique in order to separate this form from a number of allies. One form, the *Bacillus coli commune,* or colon bacillus, a constant inhabitant of the intestinal canal, resembles the typhoid bacillus so closely that as late as 1890 no less an authority than Koch declared that a sure means of differentiation between the typhoid and colon bacillus had not been discovered. Since then, however, work by a number of bacteriologists, Pfeffer, Wassermann, Löffler, Abel, Hiss and others, has given a series of distinguishing signs, so that at the present time it is possible to make a definite separation of the typhoid organism from all others. The typhoid bacillus is a short comparatively plump rod varying in length from $\frac{1}{2000}$ to $\frac{1}{8000}$ of an inch and in width from $\frac{1}{5000}$ to $\frac{1}{8000}$ of an inch. It has a number of flagella (10 to 12) which enable it to move. The marked motility of the typhoid bacillus is of much importance in the study of this form since the so-called blood-test or Widal's test for typhoid depends on a change in this characteristic. For the details of its cultural characters standard works on bacteriology should be consulted but it is of importance from the standpoint of sanitary science and preventive medicine (q.v.) to realize that the typhoid bacillus is capable of growing for a time at least in many different foods and drinks, particularly in milk and in water. Every patient with typhoid fever is constantly giving off millions of these small bacteria in stools and in urine. From these two main sources the great danger in typhoid contagion comes, for soiled fingers of chambermaids, flies, household implements may all prove intermediaries in conveying the bacilli to food and thence into the digestive canal of a well person. Or the fæces and urine may soak into a well or other source of drinking-water supply, and thus be the means of causing extensive epidemics. Contagion by uncleanliness and lack of care in disinfecting the stools and urine is responsible for most cases of typhoid fever. Destroy the bacillus by heat or by proper chemical means and typhoid fever will disappear. (See BACTERIA; TYPHOID FEVER). Consult Muir and Ritchie, 'Manual of Bacteriology'; Kolle and Wassermann, 'Handbuch der pathogene Mikroorganismen' (1902–04); Osler, W., 'Problems of Typhoid Fever in the United States' (Baltimore 1899); id., 'Studies in Typhoid Fevers' (ib. 1895); 'Public Health Report, No. 56' (Washington 1911); 'Reference Handbook of the Medical Sciences' (1915); Whipple, J. G., 'Typhoid Fever: Its Causation, Transmission and Prevention' (New York 1908).

TYPHOID FEVER, or **ENTERIC FEVER,** a specific continued fever of long duration and communicable, due to the *Bacillus typhosus* or Eberth's bacillus. It is usually attended with diarrhœa, sometimes with an eruption and is characterized by inflammation and ulceration of Peyer's patches (q.v.) in the small intestine, by enlargement of the spleen and mesenteric glands and catarrhal inflammation of the intestinal mucous membrane. It is one of the exanthemata (q.v.). This fever was called typhoid and at one time abdominal typhus, from its supposed resemblance to typhus fever (q.v.). It has also been known as low and as slow fever and as autumnal or fall fever. It is considered to be a preventable disease, yet it prevails frequently as an endemic and epidemic, especially in large cities, destroying many lives. It occurs most often in the fall and early winter and mostly between the ages of 18 and 45, when men especially are less prudent and run more to excesses than at other periods of life. Improper dwellings and bad sanitary environments, excess in eating and drinking, want of sleep and too much mental work — by these the vitality is undermined, predisposes persons even in the prime of life to the onset of typhoid, especially if it be prevailing in their community. It is believed

that the blood of such persons has undergone some chemical change which has diminished its bactericidal quality and so lowered its inherent power of resistance to disease. It is not very uncommon to find cases of "walking typhoid," i.e., persons not sick but having a temperature of 102° to 104°, especially toward evening.

Typhoid fever is frequently, if not always, a septicæmic disease and its range of infectivity is greater than is usually supposed. The bacillus has been found in the blood, urine, fæces and sputum. Milk, vegetables, flies, oysters, etc., are bearers of the germs, while the bacilli may be conveyed by air to the respiratory mucous membrane and their initial colonization take place there rather than in the gastro-intestinal tract. Typhoid fever like cholera is considered as "ingestion infection" and both are disseminated from the excreta, vomit and perhaps sputum. But drinking water polluted by the bacilli through infected sewage, etc., is the most frequent cause of typhoid infection. Germs from a single case of typhoid may find their way into springs and other sources of water supply and cause widespread dissemination of the disease. The epidemics in Lausanne, Switzerland (1872), Chicago and Philadelphia (1890–1900) and Ithaca, N. Y. (1903), are examples of typhoid outbreaks caused by polluted water. "In Vienna, when for a period the water supply from guarded springs was turned into the city, typhoid which had persisted in epidemic form for years almost entirely disappeared and when as the drier season advanced this purer supply was insufficient and the water of the Danube was again turned on the scourge broke out with renewed violence but in those parts of the city supplied by river-water. This experience was repeated in Paris and it is practically true of every city supplied with drinking water from exposed streams and lakes." Freezing does not sterilize water so that contaminated ice used in drinking fluids or coming in direct contact with food is a source of infection. The boiling of water is a safeguard while filtration is not trustworthy in the elimination of infective organisms. Next to infected drinking water infected milk is the most common cause of typhoid through the polluted hands of milkers or from the washing of receptacles for milk in cold water polluted by typhoid discharges. Such vessels should be thoroughly scalded. The ingestion of uncooked articles of food and especially of salad vegetables — lettuce, celery, etc.— raised in ground fertilized by infected sewage, is a source of infection, as is the ingestion of oysters and clams grown in water similarly contaminated. Dust carrying typhoid germs, if inhaled, may convey the disease into the system. That flies which have found access to the excrement of typhoid fever patients may carry the infecting organism to food and so produce typhoid was proved in the Spanish-American and the Boer wars. The danger of typhoid in armies is always imminent; soldiers will drink polluted water, not caring to wait till it is boiled; the ground becomes saturated with discharges; flies and dust abound, and many of the men will not keep clean. "Typhoid fever in our camps," says Sternberg, "has been to a large extent due to the neglect of well-known sanitary measures." This has been the experience in nearly all wars.

Experiments have shown that infected clothing, surface soil, fæces and urine retain active bacilli for many days and there is reason to believe that typhoid is sometimes spread through infected hands, clinical thermometers, water-closets, clothing, etc. The New York department of health, which insists upon the importance of disinfecting the urine as well as the fæces of typhoid patients, states that "it is probable that in 50 per cent of the cases the typhoid bacilli are present in the urine at some stage of the disease," and recommends keeping the urinal or bed-pan partly filled with a 1 to 20 solution of carbolic acid.

Two important means in the diagnosis of typhoid have come into use within the last few years; namely, Erlich's test or the diazo-reaction and the Widal test. The first, which has the advantage of being more readily applied, is as follows: "Equal parts of the suspected urine and a solution (saturated solution of sulphanilic acid in 5 per cent hydrochloric acid 40 parts; 0.5 per cent solution of sodium nitrite 1 part) are mixed and well shaken. On the addition of a few drops of ammonia a brilliant rose-pink color should appear, if the case be one of typhoid fever. The 12-hour sediment is also characteristic, consisting of a dirty gray lower layer and a narrower dark olive-green upper layer." The reports of army surgeons in the great European War (1914–18) show that the affection known as "para-typhoid" is more common than typhoid. It has most of the symptoms of typhoid but less pronounced and has been responsible for deaths, which have been imputed to other causes. It is believed that the bacilli responsible are a union of the Eberth and Colon bacilli as shown by the Widal reaction. A mixed serum has been used hypodermically with success against both.

Prophylaxis.—"An epidemic is like a conflagration,— it is more easily suppressed at the beginning." "An ounce of prevention is worth a pound of cure." These are two sayings quite applicable to typhoid fever. The Ithaca epidemic might have been prevented by keeping the water supply pure; but once started, "all the science of the 20th century could not save all the lives." Purity of water and cleanliness of foods, proper cooking, the thorough removal and destruction of refuse, the use of septic tanks for sewage, the getting rid of flies and other hygienic measures are the means for preventing the origin and spread of typhoid; but these measures must be persistent, not spasmodic. The term summer typhoid is frequently applied to typhoid fever appearing in cities in the fall, but originating in country summer resorts — classed, it may be, as healthful.

It is now well known that from 2 to 10 per cent of all cases of typhoid become "carriers" of the disease, some "temporary" for about three months, others "chronic" for an indefinite period, continuously or intermittently for years it may be.

Such carriers as well as walking cases of typhoid are frequent sources of infection. The bacilli collect in the gall bladder, multiply and discharge into the intestines and find their way into the urine. The germs in the undisinfected excreta of these people are carried by flies or soiled hands to food. Even persons who have never had typhoid may become carriers. "Ty-

phoid Mary» was such a carrier, acting as cook in various families and in a hospital she was responsible for 57 cases of typhoid and three deaths. Boards of health now issue directions to «carriers.»

The various efforts that have been made by the use of internal medicines such as salvarsan and unotropin, to rid the body of a carrier of the lurking germs have only been partially successful.

Anti-typhoid serums and bacterins are used hypodermically with excellent results as immunizing agents — and as a cure. The prevention of typhoid by such means in armies is a triumph.

In 1901 Parkes and Rideal reported that after detailed experiments made to determine what substances could be added to drinking-water containing typhoid or other infecting micro-organisms to make it innocuous, they had decided upon acid sodium phosphate or sodium bisulphate, in compressed tablets of five grains each, to be used three to a pint of water 15 minutes before drinking, and when not in use to be kept in a closed receptacle, as a metallic box. They believe that the substance will be efficacious unless the water is very badly polluted. The statement has been made repeatedly in newspapers that lemon-juice destroys the typhoid bacillus, and therefore should be added to suspected drinking-water. W. H. Park, the bacteriologist, shows on the contrary that while the acid kills the micro-organisms it requires too much acid and too much time for the chemical action to take place to render lemon-juice a practical agent for their destruction.

Symptoms and Course of the Disease.— The duration is usually from three to four weeks in adults in cases of recovery, though the patient may be sick many days beyond the 28th, owing to diarrhœa, loss of muscular tone, flabby heart, etc. Death may occur in the first and even the fourth week, or later, but usually takes place in the second or third week. It may result from a peritonitis set up by perforation of an ulcerated spot, from intestinal hemorrhage, even after all the leading symptoms are gone, from diarrhœa, pneumonia, nephritis, embolism, thrombosis, etc. The period of incubation, which is not definitely known, is variously stated to be from 7 to 21 days. It is difficult to determine the exact time of exposure to the poison, and the onset of the attack is usually insidious.

First Week.— The disease begins with more or less fever, lassitude and aching «in the bones,» and sometimes a chill, more often a chilly feeling, especially when the hands are put into cold water or the person is exposed to cold air. Headache, pains in the back and limbs, alternations of chilliness and heat, and sometimes vomiting, nosebleed, diarrhœa and tenderness of the abdomen supervene. The pulse rarely exceeds 85 or 90; the tongue is moist, but covered with a thin coating; the fever gradually increases, remission occurring in the morning. Toward the end of the first week the tongue becomes dry, delirium is likely to occur, weakness is marked, consciousness is numbed and diarrhœa may increase. Toward the end of this week a rash sometimes appears, consisting of small pink spots, most abundant on the abdomen and chest, then on the back and rarely on the face and extremities. The spots continue to come out as long as the fever continues, do not coalesce, disappear under pressure, and do not become hemorrhagic.

Second Week.— The tongue is very dry; if there has been diarrhœa it increases, or may appear for the first time, and is attended by gurgling, the discharges having a peculiar «pea-soup» appearance. There is more or less tenderness over the ileo-cæcal region, due to the inflammation of Peyer's patches, and some tumidity of the abdomen. Delirium increases; temperature rises at night to 102°, 104°, 105° F., or more with sharp declines in the morning (steeple-like rises, as shown on temperature chart); the pulse is frequent — 100 to 120.

Third Week.— Gradually the patient passes into the third week, and symptoms slowly abate; or he grows worse; then the tongue cracks and bleeds; sordes appear on the lips, teeth and tongue; he has low muttering delirium; tympanitis is considerable; fever continues. He may recover even now, but there is the possible danger of hemorrhage, perforation or a serious depression of the vital forces, at any stage of the disease, but chiefly in the second and third weeks. As recovery sets in the greatest care is necessary that the patient may not overeat nor exert himself unduly, lest a relapse should occur or a serious complication be induced.

Treatment.— The treatment consists of rest in bed from the outset, diet, hydrotherapy and medicines. The food through most of the sickness should be largely liquid — milk, peptonoids, etc., and predigested material, but always adapted to the patient's powers of digestion. If curds or undigested food be seen in the stools, all food should be suspended for a considerable time, or given of another kind and in small quantity every three or four hours. Later, bread and milk, milk pudding, with rice or tapioca, eggs lightly boiled, poached or shirred and cocoa may be given. The patient may drink freely of water at any time, and may have fruit-juices. When the temperature has been normal for several days he may have fish, chicken, broths, soups and may carefully and gradually resume ordinary food. Sponging with tepid or cold water, vinegar and water, or alcohol and water, and the use of wet packs — as frequently as they can be used with apparently good results are often more serviceable than drugs. Yet medicinal measures are often necessary. Coaltar derivatives should never be used except to lower the temperature, and then very carefully. Eliminatives, as calomel and intestinal antiseptics, as salol, are useful. Acetozone, or benzolyl-acetyl-peroxide, is now used internally as a germicide with benefit in many cases. Stimulants should only be used when there are signs of heart-failure and then in moderate quantity — brandy, whisky, champagne, ether and camphor. Opium, carefully used in excessive diarrhœa or in peritonitis; ice internally, and applied to the abdomen in intestinal hemorrhage; ergotine hypodermically; bromide of sodium, etc., producing necessary quiet or sleep, are all of value; but the disease cannot be shortened in its course to any extent, though its severity may be modified. Skilful nursing, therefore, is necessary. The prevention of bed-sores and the keeping the mouth

clean add much to the patient's comfort and help him to recover.

Typhoid fever in children is more common than was at one time believed. It is the "remittent" fever of childhood, the "infantile hectic" fever, etc., and seldom occurs under one year of age. It does not conform closely to the type of typhoid in adults and differs as to distinct stages and well-defined temperature changes. It runs its course in from 10 to 20 days, and is characterized by gastro-intestinal catarrh, fever, prostration, wasting, nervous symptoms and scanty isolated eruption. See PATHOLOGY.

TYPHON, tī'fŏn, in Greek mythology, a giant, the son of Tartarus and Gæa. He had 100 heads shaped like those of a serpent and with devouring flames darting from the many mouths and eyes. Typhon, as soon as born, made war on heaven to avenge the death of his brother giants, compelling the gods to fly for safety; Jupiter, however, regaining courage, threw off the resemblance of a ram which he had assumed, and, hurling his thunderbolts at the audacious invader, flung him to earth wounded and writhing, when, to prevent his recovery, he cast Mount Etna at his head and buried the rest of his body beneath the earth. Through this vast mountain, however, the imprisoned giant still belches forth his fire and smoke and howls his discordant thunder. Consult Longfellow's poem 'Enceladus,' and Meyer, M., 'Die Giganten und Titanen' (1887).

TYPHOON, name given by navigators to those tremendous rotatory storms of wind or hurricanes that visit the coast of Tonquin and China as far north as Ningpo and the southeastern coast of Japan. Typhoons are the cyclones of the Eastern Asiatic Coast. They occur from May to November but are most frequent during July, August and September. They resemble the great hurricanes of the West Indies in their general characteristics, but with the main features more strongly marked. There is a depression of the barometer, over a space more or less circular, accompanying the typhoon, but it is generally more contracted in area, and deeper and more abrupt than in European or American storms. It is not uncommon for the barometer, at the centre of the depression, to read 28.3 inches, and on rarer occasions to fall even as low as 27 inches, and the changes of pressure are very rapid, frequently two or three inches in an hour. It is this enormous difference of atmospheric pressure between neighboring places, and the consequent rapidity of the fluctuation, which gives the typhoon its terribly destructive energy — the law regulating the strength of the wind being, that it is proportioned to the difference of pressure between the place from which it comes and the place toward which it blows. The low pressure in the centre is confined to a very limited space, and since all round this space the pressure is greater, it follows that the level of the sea there will be higher. Hence a high wave frequently accompanies a typhoon, advancing inland, carrying with it ruin and dismay, and sometimes bearing ships far over the level fields, where they are left stranded. Typhoons have their origin in the ocean east of China, especially about Formosa, Luzon and the islands immediately south. They thence proceed, in four cases out of five, from east northeast toward west southwest, rarely from east southeast to west northwest, in other words, their course is generally along the coast of China. The whole body of the typhoon advances at the rate of 12 miles or more an hour; within the body thus traveling the winds often blow 80 to 100 miles an hour, whirling round the centre of atmospheric depression in a direction contrary to the motion of the hands of a watch, as do all the storms in the northern hemisphere. They thus rotate in the directions south, east, north, west, and travel along the coast, so that the coast feels the north side of the typhoon, while at a distance from the coast the south side alone is experienced. The rotation, however, is in circles not returning on themselves, nor opening outward by their centrifugal motion, but tending to blow somewhat inward upon the centre of lowest pressure. The intensity of the typhoon is aggravated by the large quantity of heat disengaged in the condensation of the vapor of the atmosphere into the deluges of rain which fall during the storm — 10 to 12 inches of rain frequently falling in one day. The meteorological offices at Manila, Hongkong and Tokio publish special studies and charts of typhoons from time to time, while the general paths with special explanations are published in the monthly pilot charts of the Pacific issued by the United States Hydrographic Office. Consult Algué, José, 'The Cyclones of the Far East' (2d ed., Manila 1904); and Doberck, W., 'Law of Storms in the Eastern Seas' (4th ed., Hongkong 1898).

TYPHUS FEVER, a highly contagious eruptive fever, one of the exanthemata (q.v.), formerly known as putrid, ship, jail or camp fever, and by other names. The disease is very rare in the United States, and when it appears it is usually in the line of immigrant travel. But owing to the very strict quarantine regulations of the American and Canadian governments it is seldom imported, or if introduced is stamped out by thorough isolation and disinfection. A constant vigilance is exerted to prevent the importation of old rags, which are seldom free from infection. The disease is also rare in the great centres of population in Europe and elsewhere, but it is epidemic in certain towns of the Old World and in some parts of Latin America where sanitation is of a most primitive kind. It is a filth-disease, therefore a disgraceful disease, and its occurrence is favored by overcrowding, bad ventilation, poor food, etc., and is especially more likely in winter. The body louse is the carrier of the disease. Though resembling typhoid fever in some respects, it is easily recognized, quarantined, disinfected and controlled. It is caused by the bacillus typhi exanthematici, discovered by Dr. Harry Plotz in 1915. There are no characteristic lesions, except that the blood contains but little fibrin and is darker than normal, and the spleen and liver are engorged and softened. Sometimes the stomach and lungs are also softened. The real cause of death is not usually acertained. The mortality of typhus fever is not much more than that of typhoid fever when there is good ventilation and strict attention to other hygienic measures, but in overcrowded and badly ventilated prisons, etc., it is very great.

The average duration of typhus (14 to 21 days) is less than that of typhoid fever. The incubation period varies from one to two weeks. The fever begins much in the same way as typhoid, with lassitude, aching in the limbs, headache, chills or chilliness, rapidly rising temperature and dark flushing of the skin. The eyes are moderately congested; there is little disposition to diarrhœa; the abdomen is not swollen or tender; and the patient is not likely to vomit, or to have nosebleed. The tongue soon becomes dry and dark, and sordes form; the pulse is frequent; as the fever reaches its height the breath and perspiration have a peculiar musty odor, and the patient passes from a state of delirium into a nearly comatose condition. Toward the end of the first week (usually the fourth or fifth day) an eruption appears on the sides of the abdomen, in the axillæ and about the wrists. For the next two days it continues to appear over the rest of the skin, except that of the face, and is most abundant on the trunk. After the third day it ceases to come out. At first the spots disappear under pressure, but after a day or two they fade out like black-and-blue spots, and in another day or two a small petechial hemorrhage appears in many of them. At its height the rash has a dull red color which Sir William Jenner compared to the juice of a ripe mulberry. When the spots coalesce and spread over a large space much danger is indicated. Treatment consists in combating the evils which give rise to the disease. The patient should be kept in a well-ventilated room with windows open even in winter; but he must also have plenty of bed-clothes, and there must be a fire in the room. Keep the room and patient thoroughly clean, and see that he has an abundance of good and easily digested food. Stimulants and other medicines will be seldom needed, yet a physician must not be dispensed with, since complications such as erysipelas and abscesses may occur. Plotz used a vaccine with considerable success in Serbia during the great epidemic there in 1915. Consult Vaughan, C. C., 'History and Epidemiology of Typhus Fever' (*Journal of the American Medical Association*, Chicago, 29 May 1915).

TYPOGRAPHICAL UNION, International, a society of typesetters, compositors and linotypers banded together for mutual protection, for the regulation of wages, fixing the number of apprentices allowed to each establishment, the length of time each apprentice must serve in order to become a master workman, and for extending general aid to the members of such association. The international or supreme body is composed of delegates from subordinate unions in the United States and Canada. The management of the internal affairs of each union is left almost entirely to the subordinate divisions. Thus each local union may regulate the number of apprentices, the scale of wages for composition, time work, etc. Whenever a member of one local union comes within the jurisdiction of another local body, he at once is subject to the by-laws of the latter. Traveling cards are granted to members, but these cards must be deposited with the local union within the jurisdiction of which its holder proposes to remain for a given length of time, and dues must be paid into the local union with which the card is deposited. It was founded in 1852 as the National Typographical Union, taking the name International in 1869. In 1882 there were 95 local organizations and a membership exceeding 10,000. In 1916 there were 754 local unions and 60,231 individual members. There are hundreds of local unions in the United States, that of New York being the largest, having a membership of several thousand — followed by Chicago, Philadelphia, Boston, Saint Louis and other large cities of the country. The International Union meets once every year, at different places in the United States and Canada. The permanent headquarters are at Indianapolis, where a large school of instruction is maintained. A home for disabled printers and tuberculars is also maintained at Colorado Springs.

TYPOGRAPHY. See PRINTING.

TYPOTHETÆ, a name given to a trade guild consisting of persons connected with the printing trades, both workmen and employers. In the year 1465 the Emperor Frederick III of Germany "permitted printers to wear gold and silver, and both the typographi and typothetæ were honored by him with the privilege of bearing coat-of-arms, and wearing armor. The shield of the typothetæ bore an eagle with extended claws, and the open helmet was surmounted by a crown." The first use of the name in the United States was in 1863, when P. C. Baker of New York proposed the name for a society of employing printers in that city. The name was adopted, but the society did not survive long. In 1883 the Typothetæ of the City of New York was resuscitated. From that city similar organizations spread all over the country, and in 1887 the United Typothetæ of America was formed. Later the Printers Boards of Trade, mostly known as Franklin Clubs, were taken into the organization, and the title now is United Typothetæ and Franklin Clubs of America. There are local Typothetæ in most of the large cities of the United States and Canada. The organization has ceased fighting actually against unionism, and confines its activities largely to trade education and improvement of conditions.

TYR, tir, in Norse mythology, the son of Odin, and the god of war and of renown. According to the Edda, he had but one hand. When the Asa-gods persuaded the wolf Fenrir to allow himself to be bound with the Gleipnir, Tyr put his right hand in the wolf's mouth, as a pledge that he would be loosened; and when the gods refused to release him, the wolf bit off Tyr's hand to the wrist, which was called in consequence, Ulflithr, or the Wolf's Joint. In the twilight battle of the gods, he meets his death at the same time with his enemy, the monster dog Garmr.

TYRANT, a word derived from the Greek *turannos*, which signified an absolute ruler. The word did not have originally the bad signification which we now attach to it; but as it is a rule which admits of very few exceptions, that the possessor of uncontrolled power, whether individual, corporation, or multitude, will abuse it, tyrant came at length to signify an abuser of power, particularly of the chief power in the state. Consult Plasz, 'Die Tyrannis bei den Griechen' (Berlin 1887), and Schömann-

Lipsius, 'Griechische Alterthümer' (4th ed., ib. 1897).

TYRCONNEL, tĕr-kŏn'ĕl, **Richard Talbot**, EARL OF, viceroy of Ireland: b. about 1630; d. Limerick, 14 Aug. 1691. He was the youngest son of Sir William Talbot, a prominent figure in politics under James I. At Drogheda he was with the forces that withstood Cromwell and one of the few that escaped the massacre there. On the accession of James II Talbot was at once made Earl of Tyrconnel and placed in command of the troops in Ireland, where he strove to secure the king's independence of Parliament by favoring Roman Catholics in the army and in official preferments, at the expense of Protestants, many of whom he summarily dismissed. In 1687 he was made lord deputy of Ireland, an appointment that added dismay to the consternation which he had already spread among the English Protestants there, many of whom quitted the country, a great part of which was given over to lawlessness, commercial decay and general wretchedness. In 1689, when James reached Ireland after his flight from England, he created the earl Duke of Tyrconnel. After the battle of the Boyne (1690), in which he fought, the duke retired to France, but in 1691 returned to Ireland and further endeavored to serve the cause of James, which, however, was soon hopelessly lost.

TYRE (mod. Arab. *Sûr*), the most famous city of ancient Phœnicia, in lat. 33° 12′ N., named probably from the double rock on which it was first founded. It was doubted among the ancients themselves whether Tyre or Sidon was the older, and the question is not settled; though it seems certain that Tyre had long existed independently when Sidon, defeated by Ascalon, transferred herself almost bodily to Tyre. There were two towns of Tyre closely connected in historical times — one on the continent, the other on the island opposite, together comprising, according to Pliny, about 19 Roman miles. The more important of the two was the continental town, Palæ Tyrus; while the island-town served more or less for storehouses, manufactories, arsenals and the like. The entire city was in a fertile region; and its magnificent combination of land and sea scenery formed the theme of many an ancient poet and seer. Nothing but myths have come down to us respecting Tyre in its earlier period. Its history dawns on us with Abibal, predecessor of the biblical Hiram, under whose rule (B.C. 980–947) Tyre attained its full glory and renown. An alliance with Solomon was entered into; trading expeditions were undertaken jointly by the Israelites and the Phœnicians; and Solomon is supposed even to have married Hiram's daughter. During Hiram's reign, Tyre was much enlarged and embellished; and its two roadstead and harbors, among the wonders of the ancient world, date probably from the same period. He was followed, according to ancient writers, by Balæastartus; after him reigned, for brief periods, his four sons, by the murder of the last of whom the throne became hereditary in the house of Ithobaal, the Ethbaal of Scripture, whose daughter was married to King Ahab. Tyre then appears to have gained the supremacy over Sidon and also spread her colonies far and wide. Shortly after the death of this king, Carthage was refounded by Elissa (Dido), about 813 B.C., in consequence of a popular demonstration which deprived her of the throne in favor of Pygmalion. This "new city" gradually diminished the importance of the old one; at least Tyre seems to have been weakened to such an extent by the emigration of its best elements that it disappears from history until the three great powers, Chaldæa, Assyria and Egypt by turns endeavored to make themselves masters of the Tyro-Phœnician Coast, with its east and west trade. Shalmaneser, king of Assyria, reduced Tyre after a long siege; and the whole of Phœnicia, the most important places of which had already thrown off their allegiance to Tyre, was rendered tributary to Assyria. During the Chaldæo-Egyptian struggle, Tyre, again at the head of the country, sided with Egypt and was conquered by the Chaldæans. Once more the Phœnicians attempted to throw off the foreign yoke, and Nebuchadnezzar marched against them at the head of his armies. Having taken Jerusalem in B.C. 587, he reduced the whole sea-coast, except Tyre, which stood 12 years' siege by water and by land, ending not in subjection, but only in an apparent submission, leaving the native sovereigns on their thrones, and their wealth and power untouched. In B.C. 538 Cyrus became master of Phœnicia, which at that time again was under Babylonian supremacy, and the hegemony was bestowed on Sidon. For a long time Phœnicia prospered under wise Persian rulers; but when Xerxes in his Greek wars, had completely destroyed the Phœnician fleet, and exhausted nearly all her resources, the exasperated inhabitants rose once more, but only to be utterly crushed. Sidon, at the head of the Revolution, was fired by its own inhabitants and again Tyre resumed the lead in 350 B.C. Having refused to pay allegiance to Alexander the Great after the battle of Issus, it was besieged by him in B.C. 332 and fell after seven months' hard resistance. Alexander replaced the old inhabitants by new colonists, chiefly Carians; and though the city had been almost destroyed, it rose again after a brief period to wealth and power, and in B.C. 315 was able to hold out 18 months against Antigonus. Under the Romans, Cleopatra received Tyre as a present from Antony; but the last trace of its independent existence was taken from it by Augustus. A Christian community had then been founded there. The trade and manufacture of Tyre, aided by its exceptionally favorable naval position, gave it, even under Roman dominion, a high place among its sister cities; and once again, in A.D. 193, it even took active part in the contest between Septimius Severus and Pescennius Niger, which, resulting in the success of Severus, brought back to it some of its ancient distinction. In Saint Jerome's time it was again the most beautiful city of Phœnicia, and one of the most prosperous cities of the whole East. In the 7th century it came under the dominion of the Saracens and so remained until taken by the Crusaders and in 1192 became the northern boundary of Christian territory in Palestine. It continued to flourish — still chiefly through its renowned manufacture of purple — until 1516, when the conquest of Selim I, together with the newly-discovered route to Asia by the Cape of Good Hope, put an end to its

wealth and commerce and almost to its existence. Although there has been a slight improvement in its prospects of late, the magnificent city of old still presents a scene of desolation and wretchedness. About 6,500 inhabitants now dwell in Sûr, among the ruins of its ancient glory, finding scanty livelihood in exports of tobacco, cotton, wool and wood. Consult Bérard, Victor, 'Les Phéniciens et l'odyssée' (Paris 1903).

TYRE, Bank of. The city of Tyre was ancient in the time of Alexander the Great. Directly or otherwise, its trade extended to all parts of the known world and embraced every commodity included in commerce. Its ships and caravans fetched tin from Britain, ivory and gold from Africa, spices and frankincense from India. For return cargoes they carried those woolens, colored by precious dyes, which constituted the basis of all its other commerce, the "bales of (purple) blue and broidered work and chests of rich apparel" mentioned in Ezekiel, xxii, et seq., a monopoly so odious to the Persians that the wife of Darius refused even to touch a piece of Tyrian woolens (Quintus Curtius, ii, 17). The enormous wealth thus created naturally led to the establishment of a bank, which after many vicissitudes was still found existing, when in A.D. 1124 Baldwin, brother of Godfrey de Bouillon, led his crusaders from the capture of Tyre, to that of Roha or Edessa, near the fords of the Euphrates. It was here that were situated the famous woolen and fulling mills and dye-works of the Tyrians. The advantages of the place were a fall of water for power, the adjacent alum deposits of Roha for mordants, the clays for fulling and the river for transport. The dye-stuffs being light were easily brought from the seacoast, where Godfrey secured the convenient shipping port of Joppa, which he erected into a countship.

Edessa was no new manufacturing town. Under its ancient name of Oorfa or Urfa it had been one almost as long as Tyre had been a trading emporium. The two places had probably been connected ever since they were founded by the Kheta, for its name of Oorfa was merely a replica of that Mongolian Oorga which down to the present day is celebrated for its woolen manufactures and beautiful but secretly applied dyes; while as to the elusive Carchemish, where the Kheta were overthrown by Sargon, it was situated at or near the fords of the more recently named Edessa.

Following the example of his brother Godfrey, Baldwin, for himself, now erected Edessa into a countship and stretched its territorial boundaries across the Euphrates, with the view to enlarge its scope of taxation, as well as its facilities for trade. He also rehabilitated the ancient Bank of Tyre and invited his crusading brethren, the Rhodians and Venetians, to make avail of its advantages as a place of security for the treasures which they were daily plundering from the surprised and defeated Greeks and Moslems. These became its principal depositors. Alluding to the crusading knights for description, Hallam says in his very first chapter: "Men resorted to Palestine, as in modern times they have done to the Colonies: in order to redeem their time, or repair their fortune. Thus Gui de Lusignan, after flying from France for murder, was ultimately raised to the throne of Jerusalem. . . . It was here in 1099, when their triumph was consummated, that it was stained with the most atrocious massacre; not limited to the hour of resistance, but renewed deliberately, after that penitential procession to the Sepulchre, which might have calmed their ferocious dispositions."

The avarice of the Knights of Rhodes was nowhere exhibited more glaringly than in their connection with the Bank of Tyre. This depository was first pounced upon by the Venetians, who after taking possession of its treasure and issuing in its stead parchment bank notes, signed by the doge Dominico Michieli, petitioned King Godfrey at Jerusalem to continue them (the Venetians) in the bank's "mercantile privileges." Instead of making this concession Godfrey conferred the "privileges" upon his brother Baldwin. Among the coveted advantages of the bank was the monopoly of the wool trade which now became the spoil of the French knight.

After Baldwin had set up his mills and dyeing works at Edessa, after he had employed the most cruel means to force from the natives the secrets of their trade, after Godfrey had arranged an organized resumption of the commerce of Tyre, reviewed its ancient bank and secured and improved an additional sea-port at Joppa, their fellow-crusader, Rohemond, a son of Robert Guiscard, led several shiploads of lazzaroni from Naples, to ravage the East, steal from his allies the stolen secrets of Edessa, and carry them to Italy, there to continue the once famous woolens trade of Tyre in the Bay of Taranto.

From that moment the Bank of Tyre declined; plunder still continued to come in and some measure of profits was gleaned from the melting of bullion, exchanges of coins, charges for the safekeeping of treasure, etc., but these items were not sufficient to support such a bank and cover the risk it ran from fire, robbery or successful fraud. The commercial community of Tyre was gone; its shipping, its trade, its connections were gone; more than all, its great woolens trade was gone; and with little prospect of their revival. Yet a forlorn hope of improvement seems to have kept it alive, or nominally alive, until the year 1145, when Edessa was besieged by a native army commanded by the brave Zenghi, or Sangiar, one of the Atabek sultans, who, after a fierce struggle of 25 days, finally made a practicable breach in its formidable walls and entered the city sword in hand. His triumph, however, was marked by his death, for here, as Gibbon regrettingly relates, fell "the last hero of his race." Although Tyre remained in the hands of the triumphant Latins, its woolens trade was lost; its commercial importance annihilated; and its bank expired and was forgotten. For the history of other ancient banks see BARCELONA, BANK OF; BYZANTIUM, BANK OF; FUGGERS, BANK OF THE; GENOA, BANK OF; MEDICI, BANKS OF THE; VENICE, BANK OF.

TYRNAU, tĭr'now, or **TIRNAU**, a town of Hungary, about 30 miles northeast of Presburg, on the Waaj Valley Railroad. Its interest was lost when the university was removed to Pesth (1635–1754). Cloth, linen, vinegar, sugar and wine are manufactured. It was for-

merly the residence of the Hungarian primates. Pop. 14,759.

TYROL, tĭr'ŏl (Ger. tē-rōl'), or **TIROL,** Austria, a crownland and principality, situated in the western part of the empire, 11,224 square miles in area, and bounded on the north by Bavaria, on the east by the crownlands of Salzburg and Carinthia, on the south by Italy and on the west by Italy, Switzerland and Vorarlberg. With the latter crownland it forms an administrative district. Its area, exclusive of Vorarlberg, is 10,300 square miles. Almost the whole area is included in the Eastern Alps, which are here almost as high and quite as complex, wild and romantic as the Swiss Alps, including large glaciers, gorges and mountain torrents. The highest point is the Ortler Spitze on the western boundary; altitude, 12,802 feet. The chief rivers are the Inn in the north, flowing into the Danube, and the Adige in the south, flowing to the Adriatic. But little of the soil is suitable for agriculture though considerable quantities of grapes and fruits are grown. Cattle, sheep and goats are raised in large numbers. Iron, zinc, copper and lignite are mined to some extent. The principal industries are cotton spinning and weaving. The chief exports are cattle, cheese, lard, wine and fruit. Of the inhabitants 55 per cent are German and 44 per cent Italians; nearly all are Roman Catholics. The capital is Innsbruck. Tyrol was anciently the eastern portion of Rhætia. It came under the House of Hapsburg in 1359 through Margaret, the heiress of the last counts. In 1805 it was ceded to Bavaria, but restored to Austria in 1814. Pop., exclusive of Vorarlberg, 852,712.

TYRONE, tī-rōn', **Hugh O'Neill,** 2d EARL OF, Irish chieftain and soldier: b. about 1550; d. Rome, 1616. He was the grandson of the 1st earl and son of Baron of Dugannon. His early life was spent in England. After the murder of his brother in 1562 he returned to Ireland, succeeding to the barony. He was called "The O'Neill," and was the leader of the Irish insurrection against Elizabeth and English occupation. Both Connacht and Leinster soon joined the standard of the Ulstermen and were met by an English army under the Earl of Essex and engaged in a war for supremacy. For some years Tyrone baffled the English army, but was overcome by Lord Mountjoy in 1603, in spite of the aid of Spain, and compelled to surrender. He was pardoned later and reinstated in his earldom. In 1607, being suspected of further intrigue, he fled to Brussels, and later to Rome, where he passed the remainder of his life living on a small stipend furnished jointly by the Pope and the king of Spain. Consult Meehan, 'Fate and Fortunes of Tyrone and Tyrconnel'; Gainsforde, 'True Exemplary and Remarkable History of Hugh, Earl of Tyrone' (1619); Bagwell, 'Ireland Under the Tudors'; Mitchel, John, 'The Life and Times of Aodh O'Neill' (New York 1868); McRory, S., 'Beatha Aoidh Ui Neill' (Dublin 1906).

TYRONE, Pa., borough, Blair County, on a tributary of the Juniata River, and on branches of the Pennsylvania Railroad, about 15 miles north by west of Altoona and 90 miles west by north of Pittsburgh. It was settled in 1840 and incorporated as a borough in 1857. It is in an agricultural region in which there are deposits of iron and nearby considerable timber. The chief manufacturing establishments are railroad shops, paper mill, iron works, lime kiln, lumber mills, shoe factory, chemical works and candy works. The educational institutions are a high school established in 1878, public and parish schools and a school library. There are several churches. The banks have a combined capital of over $400,000. The government is vested in a burgess and a council of 14 members who hold office for two years. Pop. 7,176.

TYROTOXICON, or **CHEESE POISON,** a ptomaine or poisonous principle produced in cheese and in milk by putrefaction, and the usual cause of the poisonous symptoms sometimes following the eating of ice-cream and other milk or cream preparations. The name was first bestowed by Kuhn of Leipzig, in 1824 on the poisonous principle in putrefied cheese, and by Vaughan of Michigan in 1885 on the alkaloid that he obtained by evaporating an acidulated aqueous and etherized extract of the poisoned cheese. Tyrotoxicon poisoning is accompanied by intense pain, nausea, diarrhœa, throat constriction and weakening of the heart's action. Prompt treatment should be rendered in the form of emetics, or saline purgatives, and tonics to stimulate the heart's action. See PTOMAINES.

TYRRELL, George, British Catholic theologian: b. Dublin, 1861; d. London, 1909. He was educated at Trinity College, entered the Catholic Church (1880), became a Jesuit priest (1891) and was appointed instructor in philosophy at Saint Mary's College, England (1896). He was expelled from the Jesuit order (1906) for doctrinal reasons and was excommunicated a few years later for criticizing the Pope's encyclical on modernism. In 1908 he was attacked by Cardinal Mercier and replied in a volume called 'Mediævalism.' Among his publications was 'Christianity at the Cross Roads' (1909). Consult Egerton, H., 'Father Tyrrell's Modernism' (London 1909); Petre, M. D., 'Autobiography and Life of George Tyrrell' (2 vols., London 1912).

TYRRELL, James Williams, Canadian civil engineer: b. Weston, Ontario, 10 May 1863. He took his degree as civil engineer at Toronto University in 1889 but before this date was topographer of the Geological Survey of Canada. In 1885 he joined the Hudsons Bay expedition and was employed in that work on the steamer *Alert* until 1886. He practised his profession in Hamilton, Ontario (1889–93), accompanied his brother as Eskimo interpreter on an expedition from Lake Athabasca through the Barren Lands to Chesterfield Inlet (1893), and was engaged by the government to survey the country between Great Slave Lake and Hudsons Bay (1900). He was elected president of the Ontario Land Surveyors' Association in 1905, gazetted lieutenant of the Corps of Guides (1907) and promoted to be captain (1910). He has published books on his travels.

TYRRELL, Joseph Burr, Canadian geologist: b. Weston, Ontario, 1 Nov. 1858. He was graduated at Toronto University in 1880 and at Victoria University (B.Sc.) in 1889. He was appointed to the Canadian Geological Survey staff in 1881. He accompanied the Daw-

son Survey of the Rocky Mountains (1883) and began the exploration of the country north of Calgary between the Bow and Saskatchewan rivers (1884–87). He continued his explorations in the Hudsons Bay country for years and in 1895 he retired after being promoted to a captaincy in the Governor-General's Foot Guard. In 1908 he offered a prize for the best collection of minerals and was elected president of the Canadian Institute (1910, 1911). He is the author of numerous scientific papers.

TYRRELL, tĭr'ĕl, **Robert Yelverton,** Irish classical scholar: b. Ballingarry, Tipperary, 21 Jan. 1844; d. 1914. He was graduated at Trinity College, Dublin, where he became a Fellow in 1868, professor of Latin in 1871, and regius professor of Greek in 1880. In 1898 he became professor of ancient history and after 1904 served as registrar. He is the author of 'Bacchæ of Euripides' (1891); 'Correspondence of Cicero' (1879–1900); 'Acharnians of Aristophanes in English Verse' (1883); 'Miles Gloriosus of Plautus' (2d ed., 1886); 'Sophocles' (1897); an 'Anthology of Latin Poetry' (1893); 'A Second Anthology' (1901); 'Echoes of Kottabos' (1906), with Sir E. Sullivan; 'Essays in Greek Literature' (1909).

TYRRHENIAN (tĭ-rē'nĭ-ạn) **SEA,** that portion of the Mediterranean Sea which is enclosed between Sardinia, Sicily and the Italian peninsula.

TYRTÆUS, tẻr-tē'ŭs, Greek poet who flourished about 630 B.C. His birthplace is unknown. In the war between the Lacedæmonians and Messenians, the former applied to the Athenians for a general; and the latter, it is said, in derision, sent them Tyrtæus. The bard, however, so inspired the Spartans by his warlike songs, that they reduced the Messenians to subjection. He was accordingly treated with great respect, and received the rights of citizenship. Some fragments of his songs are extant. His poems are in Greek elegiac metre and in the time of the Hanoverian monarchy were translated into English and disseminated throughout the army for the purpose of fostering the warlike ardor of the soldiers. Consult Bergk, 'Poetæ Lyrici Græci' (Vol. II, 5th ed., Leipzig 1914).

TYSON, George Edgar, American Arctic explorer: b. New Jersey, 1829; d. 1906. He sailed with the *Polaris* American polar expedition (1871) and when wrecked in Smith Sound he assumed command of the party until they were rescued by the sealer *Tigress* (1873). They had drifted with the ice pack fully 1,800 miles in the 196 days in which Tyson had kept the party together under the most trying circumstances. Consult Blake's 'Arctic Experiences' (New York 1874).

TYSON, James, American pathologist: b. Philadelphia, 26 Oct. 1841. He was graduated at Harvard in 1860 and took his M.D. degree from the University of Pennsylvania in 1863. He was professor of pathology and morbid anatomy (1876–89), professor of the practice of medicine (1899–1910) and thereafter professor emeritus of the University of Pennsylvania. He was president of the College of Physicians of Philadelphia (1907–10) and is the author of numerous medical works of high reputation, dealing chiefly with the cell theory and diabetes.

TYTLER, tĭt'lẻr, **Patrick Fraser,** Scottish historical writer: b. Edinburgh, 30 Aug. 1791; d. Malvern, England, 24 Dec. 1849. He was educated at the University of Edinburgh, and in 1813 was admitted to the bar of Scotland. In 1837 he removed to London, where he devoted himself exclusively to historical writing and other literary pursuits. His 'History of Scotland,' begun in 1828, was completed in 1843, and was accepted as a standard work. He was also the author of 'Life of James Crichton of Cluny, commonly called the Admirable Crichton' (1819); 'Life and Writings of Sir Thomas Craig of Riccarton' (1823); 'Life of John Wicliff' (1826); 'Lives of Scottish Worthies' (1831–32); 'Historical View of the Progress of Discovery on the more Northern Coasts of America' (1832); 'Life of Sir Walter Raleigh' (1833); 'Life of King Henry VIII' (1837); 'England under the Reigns of Edward VI and Mary' (1839). He was granted a civil pension of £200 a year. Consult Burgon, J. W., 'Life of Patrick Fraser Tytler' (London 1859).

TYTLER, Sarah. See KEDDIE, HENRIETTA.

TYUYAMUNITE, tyū-yä-moon-īte, canary-yellow hydrous calcium-uranium vanadate, $CaO.2UO_3V_2O_5.8CH_2O$; occurs with carnotite, the most important of the radium minerals as mined at various localities in Utah.

TZANA, tsä'nä, **Lake.** See DEMBEA.

TZE-HSI, tzē-shē, empress dowager of China: b. Peking, 1835; d. 15 Nov. 1908. She was selected for the imperial harem when but 16 and by study and good fortune in her 26th year became the virtual ruler of China. She had an abundance of political wisdom which led to her selection of Li Hung Chang as her chief adviser. She was unable to prevent the Boxer Rebellion but its tragic results taught her a lesson and thereafter she encouraged the modernizing of China. It was largely through her influence that the country threw off the curse of opium. She was an ambitious woman but remarkably patriotic and her good deeds far surpassed the evil credited to her time. Consult Bland and Backhouse, 'China under the Empress Dowager' (Philadelphia 1910); Sergeant, P. W., 'The Great Empress Dowager' (New York 1911), etc.

TZETZE, tsĕt'sĕ, a musical instrument of the guitar kind, formed of a long carved neck attached to a gourd. It has one string usually made of the tough fibre of a palm tree. The tzetze is of Abyssinian origin.

TZETZES, tsĕt'sēz, **Johannes,** a Byzantine author of the 12th century. His 'Chiliades,' a very dull collection of 30,000 "political iambics," whose theme is stories drawn from Greek history and mythology, has been edited by Kiessling (Leipzig 1826); his 'Iliaca,' a résumé of Homer's 'Iliad' and kindred poems, by Bekker (1816). Commentaries on Homer, Hesiod, the 'Plutus' of Aristophanes and Lycophron's 'Alexandra' (ed. by Müller 1811), make up the remaining works of Tzetzes. Consult Krumbracker, K., 'Geschichte der byzantinischen Litteratur' (2d ed., Munich 1897) and Spelthahn, H., 'Studien zu den Chiliades des Johannes Tzetzes' (ib. 1904).

U

U the twenty-first letter and fifth vowel of the English alphabet. Its form in the Latin alphabet was V. In the Greek alphabet the character Υ represented a vowel sound different from that represented by the Latin V (the vowel *v* or *u*); probably this Greek letter stood for a sound like that of *u* in French, which in German is represented by *ü;* and the Greeks had no single character in their alphabet to represent the pure and simple vowel sound which *u* had in Latin and has in modern European languages except English and French: this vowel sound the Greeks represented by the digraph *ου* as it is usually represented in English by the digraph *oo;* and in French by *ou.* When a Greek word containing *υ* was to be translated into Latin the *υ* was represented by *y,* and the same is still done in English: Thoukydides (*θουκυδίδης*) and *τύχη* become Thucydides and Tyche. In the Latin alphabet the vowel *u* (*oo*) and the consonant *u* (or *w,* or *v*) were both represented by *V,* and not till late in the 16th century was the form *V* restricted to the consonant element. The sound of *u* (*oo,* not as named in English, *yu*) is produced by rounding the lips to the fullest extent consistent with a clear vowel sound and raising the back of the tongue higher than for any other rounded sound. This sound, short, is heard in *full,* and long in *fool;* and it is commonly represented in English by that digraph *oo;* in French it is represented by *ou,* but in the rest of the European alphabets by *u.* The fact that the primitive vowel sound *u* is expressed in English by *oo* is an indication that at one time the *o*-sound had a tendency to pass into the sound of *u*: thus *good, foode,* once were *gode, fode.* Besides the related sounds heard in *too* and *full, u* represents in English two other sounds, namely, the vowel sound heard in *tub, but,* and the diphthongal sound heard in *use, repute.* The sound of *u* in *but, tub* is especially common in English, and in unaccented syllables is represented also by other vowels, as *a, e* and *o;* examples *every, common, fashion,* which might be written *evury, commun, fashun. U* is consonantal after *g* and in some other places. It is silent in such words as *guard, build,* etc. *Gu* in French and in English words derived from the French is often derived from a Germanic *w.* The letter *u* in Chaucer's time was pronounced like French *u* in words derived from the French; and Sir John Cheke, writing 200 years after Chaucer, declares that in his day the *u* in *duke, lute, rebuke* was sounded "like the Greek upsilon," that is, like the French *u. U* stands for uranium in chemistry. See ALPHABET.

UARAYCU, ooâ-ri'koo, a tribe on the lower reaches of the Jura River in western Brazil. They are known for their peculiar customs, notably those for testing the fortitude of their children and for betrothal in childhood. They burn their dead and bury the ashes in their huts.

UARDA, by George Ebers. Two generations of German children, and a good many of their fellows in other lands, have had their first taste of Egyptian history and folklore through the medium of George Ebers' historical romance, 'Uarda' (1877) and its companion-piece, 'An Egyptian Princess.' Ebers, who was an Egyptologist of distinction, made a great point of the accuracy of his description of religious rites, science, warfare, dress, manners and customs; and yet, except to the young, 'Uarda' carries no illusion of ancient times because the characters themselves think and feel as moderns do. Uarda is a story of the time of Rameses II and the hero is Pentaur, the priest and epic poet.

UAUPÉS, wā-ō-pās', Colombia, a river rising in the eastern cordillera of the Colombian Andes, and flowing southeastward to the Rio Negro, which it joins in the northwestern corner of Brazil. Length about 700 miles. The lower course of the stream is navigable.

UBANGI, oo-bäng'gē, or **MOBANGI,** mō-bäng'gē, a river of Equatorial Africa, a tributary on the right bank of the Kongo, which it enters in lat. 0° 30′ S. It is the lower course of the Welle or Makua, which has its sources to the north of Lake Albert Nyanza. It is navigable, but there are difficult rapids at Zongo in 40° 20′ N. Throughout a large part of its course down to its confluence with the Kongo it forms the boundary between the Belgian Kongo and French Equatorial Africa. By means of the Kongo and the Ubangi it is possible to go from the coast of the Belgian Kongo almost to the Nile Valley. The basin of the river is very fertile and more thickly populated than most other parts of central Africa. The part of the river known as the Welle was discovered by Schweinfurth in 1870; other portions were successively explored by Junker (1880), Hanssens (1884), Grenfell (1886) and others, and about 1890 the several parts were identified as belonging to the Ubangi. Consult Wauters, A. J., 'Les bassins de l'Ubangi et de la Sanga' (Brussels 1902).

UBERTI, oo-bĕr'tē, **Bonifazio degli,** Italian poet: b. Pisa, about 1309; d. after 1368. He belonged to the noble family of Uberti, his grandfather having been a leader of the Florentine Ghibellines, and spent much of his time in exile. His 'Dittamondo,' an unfinished didactic poem in the style of the 'Divine Comedy' of Dante, placed him among the celebrated

writers of the Italian Renaissance. His lyrical poems received much later recognition. Consult 'Dittamondo' (Milan 1826); Pellizzari, 'Il Dittamondo e la Divina Commedia' (Pisa 1905); Renier, R., 'Le liriche edite e inedite di Fazio degli Uberti' (Florence 1883); Whitmore, 'Fazio degli Uberti as a Lyric Poet' (in *Romantic Review*, New York 1914).

UBIQUARIAN, ū-bĭ-kwā'rĭ-ạn, or **UBIQUITARIAN**, a believer in the doctrine that the body of Christ, in virtue of the hypostatic union of his divine and human natures, is everywhere — in Latin, *ubique*. The opinion was held by individual theologians in the 10th and succeeding centuries, foremost among them the renowned English schoolman William of Ockham in the 14th: Christ's body after his resurrection, he held, is ubiquitous. In the conference at Marburg of Luther and Melanchthon with Zwingli and Œcolampadius, Luther explained in this way the true, real, corporeal presence of Christ in the Eucharist; and in the authoritative Formula of Concord (1577) the doctrine of the ubiquity of Christ's humanity is expressly taught. But after Luther's death Melanchthon and other leaders repudiated Luther's doctrine of consubstantiation, while Brentius and Andreæ defended it as an article of Lutheran orthodoxy. See CONSUBSTANTIATION; TRANSUBSTANTIATION.

UCAYALE, oo-kī-ä'lä, or **UCAYALI**, Peru, a river flowing northward through the eastern part of the country, and joining in long. 73° 20′ W. the Amazon, of which it has sometimes been regarded as the true upper course. Its main headstream, the Apurimac, rises in the mountains 115 miles northwest of Lake Titicaca, and another headstream, the Mataro, comes within 100 miles of the Pacific Coast opposite Lima and over 13,000 feet above sea-level. The headstreams water the most populous districts of Peru, but the main course lies in the wild, forest-covered lowlands. It has a length of about 1,500 miles, more than half of which is navigable for steamers. Its principal affluent is the Pachitea which is navigable to a point about 300 miles distant from Lima.

UCCELLO, oo-chĕl'lō (PAOLO DI DONO), Italian painter: b. Florence, 1397; d. there, 1479. He began as a goldsmith and worker in metal, assisting Lorenzo Ghiberti (q.v.) in the first pair of gates made by the latter for the baptistery at Florence. His name of Uccello ("Bird") was given to him from the number of birds he kept as models for his pictures. Among the few works of his which have survived is a heroic-sized equestrian figure of Sir John Hawkwood in the cathedral at Florence, painted in terra verde (q.v.). In the Louvre there is a picture of his which is principally interesting from the fact that it contains life-sized portraits of Giotto, Donatello, Brunelleschi, Manetti and Uccello himself. In S. Maria Novella is a number of frescoes depicting scenes from Genesis and his 'Battle of San Romano' is preserved in the Uffizi. The Metropolitan Museum, New York, contains his 'Man and Woman of Portinari Family.' Consult Berenson, Bernhard, 'Florentine Painters of the Renaissance' (3d ed., New York 1909).

UCHEAN, ū'chē-ạn (adapted from *Uchee* or *Yuchee*), a linguistic stock of North American Indians who, in the 16th century, lived on both sides of the Savannah River as far as its mouth in South Carolina and Georgia. They are supposed to be identical with the "Cotifachiqui" of De Soto's chroniclers, whose principal settlement was at the site of Silver Bluff on the Savannah, in Barnwell County, S. C. In 1729 a portion of the Yuchees, as the one surviving member is called, left their old seats and settled among the Lower Creeks on Chattahoochee River, where they established three villages in the neighborhood; and later a Yuchee settlement is mentioned as existing on the Lower Tallapoosa, among the Upper Creeks. The tribe finally became practically a part of the Creek confederacy, and on the removal of the latter to the Indian Territory the Yuchees went with them. The surviving members of the tribe are usually classed as Creeks, but while the latter are doubtless intermarried with them, the Yuchees are jealous of their name and tenacious of their position as a tribe.

UCHIDA YASUYA, oo-chee-dä yä-sooyä, Japanese statesman: b. at Kumamoto, February 1865. Educated at the Imperial University of Tokio and graduate of the College of Law in 1887, he entered the diplomatic service as the attaché of the legation in Washington, served as secretary in the foreign office in Tokio and of the legations in London and Peking. In 1895 he was made minister resident in China. He served in other offices, at home and abroad, until, in 1899, he was made Vice-Minister of Foreign Affairs, and Minister to Peking in 1901–06, ambassador to Vienna 1907 and created baron. He was sent to Washington in 1909 and in 1912 called to be Minister of Foreign Affairs in the Saionji cabinet. He was again dispatched to Washington as ambassador, a public dinner in his honor being tendered to himself and wife by the Japan Society of New York. In 1916–17 he was ambassador at Petrograd and in 1918 was made Minister of Foreign Affairs in the Hara cabinet.

UCKEWALLISTS, ŭk-ĕ-wol'ĭsts, a religious sect so denominated after the name of its founder, Uke Walles, native of Friesland, who in 1637 published his opinion regarding human salvation. He taught the doctrine of Universalism, and held that the period between the birth of Christ and the descent of the Holy Ghost was one of profound spiritual darkness and ignorance, during which the Jews were deprived of divine illumination, and that, therefore, their rejection of the Messiah and their complicity in the Crucifixion would not be visited with the uttermost penalties by Divine Justice. After the death of their founder, the Uckewallists became merged in the Mennonite sect.

UDAIPUR, oo-dī-poor', or **ODEYPORE**, India, (1) A northwestern town, capital of a native state of the same name in Rajputana, 70 miles west of Gwalior. It is finely situated beside a lake 2,000 feet above sea-level, contains a notable royal palace, and exports cotton, indigo, etc. The old fortresses guarding the city are now in a dilapidated condition. Pop.

47,587. (2) The state (called also MEWAR), with an area of 12,756 square miles, came under the protection of Great Britain in 1817, and the raja ranks highest in dignity among the Rajput chiefs. Pop. 1,293,776.

UDAL, the name of a system of land tenure common in northern Europe before the feudal system. It is now preserved in Orkney and Shetland. The tenure was completed by undisturbed possession and provable by witnesses before a court. Though dependent on the Crown the incumbent pays only a slight tax known as *skat.* The tenure has been held by the English Court of Sessions to be equivalent to allodia; and the lands under it have been generally converted into fens. Consult Stubbs, William, 'Constitutional History of England' (Vol. I, 6th ed., Oxford 1897).

UDALL, ū'dal, or **UVEDALE, Nicholas,** English scholar and dramatist: b. Hampshire, 1504; d. London, 23 Dec. 1556. He was educated at Winchester and Corpus Christi College, Oxford, from which he was graduated in 1524. He is said to have imbibed Lutheran opinions and to have been on this account prevented from getting his M.A. degree until 1534. He now became headmaster at Eton, a post which he held till 1541, when he was dismissed. He continued, however, to hold till 1544 the vicarage of Braintree to which he had been appointed in 1537, and he gained the favor of Catharine Parr, queen of Henry VIII. Under her patronage he translated part of Erasmus' 'Paraphrase of the New Testament.' He was also in high favor at the court of Edward VI and held more than one benefice. On the accession of Mary he continued to maintain himself in favor and from 1554 till shortly before his death was headmaster of Westminster. Udall is now only remembered by his comedy 'Ralph Roister Doister,' a somewhat rude work in rhymed verses licensed in 1566 but probably written as early as 1540 and acted by the boys of Saint Mary's College, Eton. Several editions of this earliest of English comedies have since appeared, among them one in Arber's 'Reprints' (London 1869) and one in Dodsley's 'Old Plays' (1874). Consult Ward, A. W., 'English Dramatic Literature' (Vol. I, rev. ed., London 1899).

UDINE, Giovanni da, jō-vän'nē dä oo-dē'nē, Italian painter: b. Udine, Northeast Italy, 1487; d. 1564. He was originally a pupil of Giorgione at Venice and there did much decorative work. Afterward he was associated with Raphael in frescoing the loggias of the Vatican and the Villa Farnesina. His work here completed, he returned to Udine in 1527 and painted many pictures for that city and neighboring places, executing the frescoes in Colloredo Castle. He also furnished the designs for the stained glass windows in the Biblioteca Laurenziana at Florence.

UDINE, North Italy, capital of the Udine province (ancient Utina), 83 miles northeast of Venice, forms a kind of double town — an outer and an inner — both surrounded by walls. It contains a castle (now barracks) on an eminence, a cathedral. archbishop's palace, museum, technical institute, etc. All these structures are of great interest both historically and architecturally. The silk industry is important and there is a considerable trade, especially in flax and hemp. Leather, metal ware, paper, velvets and silks are manufactured in Udine. The city was the military base of the Italians in the war with Austria 1915–18. Pop. 47,617. On 29 Oct. 1917 the city was occupied by the Austrian armies. See WAR, EUROPEAN.

UDO, a plant (*Aralia cordata*) of the ginseng family, native of Japan. The young shoots, after being blanched, are used in much the same ways as asparagus, also in salads. Udo is grown extensively in Japan and has been introduced into the United States in recent years.

UEBERWEG, ü'bĕr-vĕg, **Friedrich,** German philosophical writer: b. Leichlingen, Rhenish Prussia, 22 Jan. 1826; d. Königsberg, Prussia, 9 June 1871. He was educated at Göttingen and at Berlin and in 1862 became extraordinary professor at Königsberg. He was appointed to the chair of philosophy there in 1867 and remained in that position until his death. He published 'System der Logik und Geschichte der logischen Lehren' (1857); 'Ueber die Echtheit und Zeitfolge der Platonischen Schriften' (1861); 'Grundriss der Geschichte der Philosophie' (1863), etc. Consult Lange, F. A., 'Friedrich Ueberweg' (1871); Brasch, 'Die Welt und Lebensanschauung Friedrich Ueberweg's nebst einer biographisch-historischen Einleitung' (Leipzig 1889).

UFA, oo'fä, Russia, (1) capital of the government of the same name, on the Bielaya, at the confluence of the Ufa, 735 miles east by north of Moscow. It is defended by a citadel; is the see of a bishop and has a number of handsome and regular streets and considerable manufactures and trade. Pop. 103,485. (2) The government was separated in 1865 from Orenburg; area, 47,130 square miles. On the east, where it is bordered by the southern Urals, the country is mountainous, wooded, provided with excellent pastures and rich in minerals. It is well watered by the Bielaya with its tributaries and has abundance of good arable land. To the west of the capital the country becomes flat and to the south steppes prevail. While very healthful the climate is severe. Copper, coal, iron, petroleum and sulphur are produced in small quantities, mining being yet largely undeveloped. Rye, oats and wheat are extensively grown and dairy farming is advanced. Kymiss is an important product. Pop. 2,988,500, comprising about 1,400.000 Russians and the remainder Bashkirs, Meshtcheryaks and Tatars.

UGANDA PROTECTORATE, a British East Africa protectorate lying north of Lake Victoria Nyanza and bounded on the north by the 5th parallel of north latitude, dividing it from the Egyptian Sudan, on the east by Lake Rudolf and the British East Africa Protectorate, on the south by Victoria Nyanza and East Africa (late German colony) and on the west by the Belgian Kongo. Its total area is 109,119 square miles, including 16,377 square miles of water. For purposes of administration Uganda is divided into five provinces (a) the Eastern province, comprising the districts of Busoga, Bukedi, Teso, Lango, Karamojo and Lobor; (b) Rudolf province, comprising the districts of Turkwel, Turkana and Dabossa; (3) Northern province, comprising the districts of Bunyoro, Gulu, Chua and West Nile; (d) the

Western province, comprising the districts of Toro, Ankole and Kigezi; and (e) Buganda province, with islands in Lake Victoria, comprising the districts of Mengo, Masaka, Mubendi and Entebbe. With the exception of the Rudolf province and the districts of Karamojo and Lobor, the whole protectorate is at present under direct administration; but the native kings and chiefs, whose rights are in some cases regulated by treaties, are encouraged to conduct the government of their own subjects. The province of Buganda is recognized as a native kingdom under a kabaka, who is assisted in the government by three native ministers and the Lukiko, or native assembly. In Buganda and in Bunyoro, Ankole and Toro purely native matters are dealt with by the Lukiko, but in certain cases there is an appeal to higher courts. For Europeans and non-natives justice is administered by English courts.

Topographically Uganda is greatly diversified, having great plains, forests, swamps, deserts and snow-capped heights. Rudolf province is very hot and although it has an elevation of over 2,000 feet it is very barren. The most fertile portion of the protectorate lies to the north of Victoria Nyanza, although the climate here is unhealthful and fraught with malaria. The part adjoining the Belgium Kongo on the west has well-forested hills and fertile plateaus and the climate is healthful. There is a peculiar native grass, much used by the natives as thatch, which often reaches a height of 12 feet or over. Lions and leopards, antelopes, wild cattle and crocodiles are numerous. Iron ore has been found in several districts and gold has been found in the north. Cotton is now grown in ever-increasing quantity. In March 1917 the total population of Uganda was 2,954,861, comprising 2,950,504 natives, 3,548 Asiatics and 809 Europeans. Among the natives approximately 600,000 belong to the intelligent, civilized Baganda, a race converted to Christianity in the 19th century. Education is in the hands of missionary societies, French (Catholic) and English (Anglican), to which the government grants about $6,000 yearly for scholarships for students and teachers. The Bantu languages are spoken by about 1,700,000 natives, a few Kongo pygmies live near the Semliki River, the remainder of the natives are of the Masai, Nilotic or Sudanese stocks. In 1917 the total imports amounted in value to about $6,500,000 and the exports to $5,380,000. The principal imports were textiles and yarns, $1,600,000; foodstuffs, $700,000; cotton, blankets, $150,000; sacks, $120,000; soap, $122,000; bicycles, $84,000; petroleum, etc., $75,000; agricultural implements, $75,000; clothing, $60,000. Exports consisted mainly of cotton, $1,800,000; coffee, $560,000; chillies, $135,000; ghee, $90,000; rubber, $29,000.

In 1917 the revenue of the protectorate was $1,577,290 and the expenditure $1,446,540. The headquarters of the British administration is at Entebbe; the native capital of Uganda is at Mengo, Kampala. Nile steamers from Khartum ply to Rejaf, which is about eight days' march from Nimule, the northern boundary of the protectorate. A regular steamer service is maintained by the Uganda Railway Administration between Kisumu, the railway terminus, and Entebbe, Port Bell and Jinja, all on Lake Victoria. The Busoga Railway Marine deals with traffic on Lake Kioga. There is also a steamer and subsidiary craft plying on Lake Albert and the Nile between Butiaba and Nimule. The Busoga Railway, 62 miles long, joins Jinja, on Victoria, to Namasagali, a point on the Nile below the rapids. There are also a railway between Port Bell and Kamfala and a number of motor transports. The protectorate has 1,373 miles of telegraph line and there are telephone exchanges at Entebbe, Kampala and Jinja.

The currency is based on the Indian rupee and consists of silver rupees with a subsidiary coinage of 50- and 25-cent pieces and minor coins of nickel. British sovereigns also are in circulation.

The territories now included in the protectorate came under British influence in 1890 and a portion of them was for a time administered by the British East African Company. In 1894 a British protectorate was declared over the kingdom of Uganda and some of the adjoining territories and the area was gradually extended to the present limits. Speke first visited the region in 1862 and in 1875 H. M. Stanley passed through it.

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UGOLINO, oo-gō-lē'nō (DELLA GHERARDESCA), della gā-rär-dēs'kä, COUNT OF DONORATICO, Italian leader: b. Pisa, about 1220; d. there, March 1289. He was one of the leading Ghibellines of Pisa, but, with the purpose of obtaining supreme power in the Pisan republic, entered into a conspiracy with Giovanni Visconti, head of the Guelfs. Banished by his own party, he was later allowed to return. When subsequently Pisa was threatened by the Genoese under Oberto Doria, Ugolino was appointed to command the defense. In the battle of Meloria, 6 Aug. 1284, he fled, thus deciding the contest overwhelmingly in favor of the Genoese. Treachery on this occasion has been generally imputed to him, but it has also been asserted that there is no adequate evidence for this view. However that may have been, the Pisans now granted Ugolino his opportunity and by naming him capitano and podestá, at first for one year and later for 10 years, made him practically dictator of the state. Lucca and

Florence joined Genoa for the spoliation of Pisa, but Ugolino, not without extensive cessions of territory, drew them from the alliance. More fully to obtain the confidence of the Guelfs, he made Nino Visconti associate-podestá. The latter, however, plotted with the Archbishop Ruggiero Ubaldini for Ugolino's overthrow. In July 1288 he was besieged in the Palazzo del Popolo and compelled to surrender. His death by starvation in prison was related by Dante, who, in a passage to which Ugolino owes most of his fame, places him above the Archbishop Ruggiero on the inward margin of the second division of the lowest (ninth) circle of the Inferno. The narrative was paraphrased by Chaucer ('Monk's Tale') and translated by Medwin with the assistance of Shelley (consult appendix to Dowden's edition of Shelley). Consult Del Noce, 'Ugolino della Gherardesca' (1890).

UGRIAN, a term used in ethnology and comparative philology with somewhat different denotations. In ethnology it usually denotes a group of peoples of Mongolian stock extending from the rivers Ob and Ural in the east to the Baltic and the Danube in the west and south, and is thus an alternative name for Ugro-Finnish or Finno-Hungarian. In the science of language Ugrian, Ugro-Finnish or Finno-Hungarian describes one of the great main branches of the Ural-Altaic (otherwise Turanian) group of languages. The Ugrian languages have no grammatical gender and cases of nouns denoting locality are richly developed. Possessive suffixes take the place of our possessive pronouns. The verb has in general but two tenses, one for completed and the other for uncompleted action. Some of the Ugrian languages, such as Hungarian, have an objective conjugation of the verb, in which the personal object is expressed by a suffix. Most of these languages have a special negative conjugation, in which the negation is conjugated while the verb remains unaltered. See FINNS; HUNGARY.

UHDE, Fritz von, German historical and genre painter: b. Wolkenburg, Saxony, 22 May 1848; d. 1911. For a while a student in the Dresden Academy, he left the institution to enter the Saxon army, in which he fought during the Franco-Prussian War and became captain of cavalry. He resumed art at Munich (1877), but soon went to Paris, where he was a pupil of Munkácsy. After a period of genre-work in the old Dutch style, he turned to sacred subjects, abandoning modern artistic traditions in that field and presenting his themes in a contemporary guise, somewhat after the fashion of the mediæval painters. This, together with a certain dullness of composition, long prevented the recognition in many ways due him. His pictures, however, found their way into many German galleries; he obtained several distinctions, including a Munich professorship; and his ideas influenced considerably the trend of German art. Among his works are 'Come Lord Jesus, Be Our Guest' (1885; National Gallery, Berlin); 'The Last Supper' (1886); 'The Sermon on the Mount' (1887); 'The Organ-Grinder's Arrival' (1883); 'Drum-Practice' (1883); a 'Last Supper' (1897) for the Stuttgart Museum; 'Richard III'; 'The Ascension' (1898); 'Woman, Why Weepest Thou?' (1900), for the Vienna Museum; and 'Going Home' (1908). Consult the monograph by Von Ostini (1902); Rosentrogen in *Klassiker der Kunst* (Stuttgart 1908).

UHL, ool, **Edwin Fuller,** American diplomat: b. Rush, N. Y., 14 Aug. 1841; d. Grand Rapids, Mich., 17 May 1901. He removed with his parents to Michigan in 1844, was graduated from the University of Michigan in 1862 and was admitted to the bar in 1864. He was prosecuting attorney for Washtenaw County in 1871–72 and in 1876 removed to Grand Rapids, where he engaged in law practice until his election as mayor of that city in 1890. He was re-elected in 1891 and in 1893 he was appointed Assistant Secretary of State. While *de facto* Secretary of State during the illness of Secretary Gresham he was entrusted with the arbitration of the boundary dispute between Brazil and the Argentine Republic. He was Ambassador to Germany in 1896–97 and then resumed his law practice.

UHLAND, oo'länt, **Johann Ludwig,** German lyric poet: b. Tübingen, 26 April 1787; d. there, 13 Nov. 1862. He studied jurisprudence at Tübingen and was for a time an advocate at Stuttgart, subsequently giving his attention to linguistic pursuits. His earliest poetry dates from 1800 and the first collection of his poems appeared in 1815. In this year also he began to attract attention as a patriotic song-writer in connection with the political changes of the day, particularly those affecting his native state of Württemberg, 'Vaterländische Gedichte' appearing in 1816. In 1818 his tragedy, 'Ernst, Herzog von Schwaben,' appeared, and in 1819 another drama, 'Ludwig der Baier.' His fame, however, rests on his songs and ballads, several of which are among the most renowned in German literature, and are well known in English through translations by Longfellow. In 1819 he was elected by his native town of Tübingen, and later by Stuttgart, to the assembly of the states of Württemberg, and in 1830 was appointed extraordinary professor of German languages and literature at Tübingen, but resigned this appointment in 1833 to take his place as a representative in the assembly. In 1848 the electoral circle of Tübingen elected him their representative in the German National Assembly. Among his antiquarian works are 'Ueber das altfranzösische Epos' (1812); 'Ueber Walther von der Vogelweide' (1822); 'Ueber den Mythus der Nordischen Sagenlehre vom Thor' (1836); 'Alte hoch-und niederdeutsche Volkslieder' (1844–45; 3d ed., 1892). Consult the edition of his scientific works edited by Holland, Keller and Pfeiffer as 'Scripten zur Geschichte der Dichtung und Sage' (1865–72) and the several editions of his poetical works entitled 'Gedichte und Dramen.' An edition of his poems, together with his life, was published at Stuttgart in 1863. Consult Bernherdt, 'Uhlands politische Betätigung' (1910); Hartmann, A., 'Ludwig Uhland' (Stuttgart 1913); Jahn, 'Ludwig Uhland' (1863); Notter, 'Ludwig Uhland' (1863); 'Ludwig Uhlands Leben, von seiner Witwe' (1874); Fischer, 'Ludwig Uhland' (1887); Diederich, 'Uhland als Dichter und Patriot' (Gotha 1886); Paulus, 'Ludwig Uhland und seine Heimat' (1887).

UHLANS, oo'lans or ū'lans, a variety of light cavalry introduced into central Europe by

the Tatars. They were armed with sabre, lance and later with pistols. Just under the point of their lances hung gaily colored cloth, meant to frighten the enemy's horses; the lance itself was carried in the left hand and attached by a strap under the left shoulder. The Uhlans were adopted from the Tatars by the Poles, Austrians, Russians and Prussians. The last-named nation used them with great effect in the Franco-Prussian War, in which they won brilliant victories by their bravery and marvelous activity. In the War of 1914–18 the Uhlans of the Prussian service covered themselves with ignominy by their wanton acts of cruelty, plunder and rapine in the march through Belgium and northern France.

UHRICH, ü-rēk (Ger. oo'rĭH), **Jean Jacques Alexis,** French soldier: b. Pfalzburg, Lorraine, 15 Feb. 1802; d. Passy, France, 9 Oct. 1886. He was educated at the military academy of Saint Cyr, France, and in 1823 served in the campaign in Spain. He subsequently served in Africa, was appointed brigadier-general in 1862 and in the Crimean War became general of division. In 1862 he became grand officer of the Legion of Honor, and at the outbreak of the Franco-Prussian War was assigned to the command of Strassburg. Notwithstanding the importance of the post it was inadequately garrisoned and fortified, but when the Germans demanded its surrender in August 1870 Uhrich refused. In the bombardment which followed the Germans hurled 200,000 balls and shells into the city, yet its commander stoutly resisted the siege until 27 Sept. 1870, when, convinced of the impossibility of holding the city, he surrendered. His defense won high praise from the German officers and in recognition of his services he was awarded the Grand Cross of the Legion of Honor. He wrote 'Documents relatifs au siège de Strasbourg' (1872).

UHRICHSVILLE, ū'rĭks-vĭl, Ohio, village in Tuscarawas County, on the Stillwater Creek, and on the Pittsburgh, Cincinnati, Chicago and Saint Louis and the Baltimore and Ohio railroads, about 100 miles south of Cleveland and the same distance northeast of Columbus. It was founded in 1833 and was called at first Waterford; the name was changed to Uhrichsville in 1839. It is an agricultural and stock-raising region, and in the vicinity are deposits of clay. The chief industrial establishments are connected with clay products as brick, drain-tile and sewer-pipe. There are extensive shipments of clay products, wool and farm and dairy products. The city has several churches, a high school, public graded school and a school library. Coal-mining is extensively carried on. Pop. 4,750.

UINTAHITE, ū-ĭn'tą-hīt, a very pure and highly lustrous variety of asphaltum from the Uintah Mountains, Utah. See GILSONITE.

UINTATHERIUM, ū-ĭn-tą-thē'rĭ-ŭm, one of the huge horned ungulates of the group *Amblypoda,* fossil in the Eocene strata of the Uintah Mountains of northeastern Utah, whence the name "Uinta-beast" is derived. They were massive, five-toed, rhinoceros-like animals, with heavy heads, an ample dentition, with very large canines, like short tusks, from the upper jaw, and four or more pairs of horns upon the skull, supported by large cores. Closely allied were *Tinoceras, Coryphodon,* etc.

UIST, wĭst, **North** and **South,** Scotland, two islands in the Hebrides, south of Harris, and separated from each other by the island of Benbecula. North Uist is about 18 miles long, with a breadth varying from 4 to 10 miles. South Uist is about 21 miles and has a width of about 8 miles. The soil is fertile. Cattle-raising, fishing and agriculture are the chief occupations. Pop. (North Uist) 3,753; (South Uist) 5,109.

UITLANDERS, oĭt'lăn-dẹrz, or **OUTLANDERS,** the name given by the Boers, prior to the South African War of 1899–1902, to the foreign residents of the Transvaal, the majority of whom were British subjects attracted by the discovery of gold in 1886. The refusal of the Transvaal government to give them the franchise resulted in the extinction of the South African Republic. See SOUTH AFRICAN WAR; TRANSVAAL COLONY.

UJI-YAMADA, oo-jē-yä-mä-dä, the sacred city of Japan, where are the great Shinto shrines, which for over a thousand years have been the centre of national and ancestral worship. To this place of peerless sanctity, the emperor, after every important event, sends a message to make announcement to his ancestress, the Sun goddess. Uji and Yamada, formerly separate, form now one municipality, with railway, electric cars and lights and modern edifices. It produces lacquer-ware, chopsticks, flutes, paper pouches for tobacco, umbrellas, etc. The shrines, parks and places of interest attract many thousands of pilgrims annually. Pop. 40,357.

UJIJI, oo-jē'jē, or **KAVELE,** East Africa, a town in the Ujiji district, situated on the northern part of the east shore of Lake Tanganyika. It is the principal trading post on the lake, and a station for steamers. It is reached from Dar-es-Salaam on the coast, 743 miles away, by a railway. It was here that Stanley found Livingstone in 1871. Pop. 8,000.

UJJAIN, oo-jīn', India, a town in Gwalior, on the Sipra, 350 miles northwest of Bombay. It is six miles in circumference, and was formerly surrounded by a stone wall with round towers. It is the ancient capital of Malwa and contains Scindia's palace, a poor edifice. It has a considerable trade in opium, cotton and grain. Pop. 39,890.

UJVIDEK, ooy'vē-dāk, Hungary. See NEUSATZ.

UKASE, ū-kās', under the empire, a Russian term applied to edicts whether legislative or imperial. The term was not extended to the orders of the ministers. Ukases had the force of laws until annulled by subsequent edicts and many such orders were issued in the course of one reign. In 1827 Emperor Nicholas had the great mass of accumulated ukases collected, collated and codified. This code, called the svod, published in 48 volumes, with the modifications of subsequent ukases codified annually, formed the body of the Russian law until the establishment of the Soviet government in November 1917. Imperial orders for a day such as military orders during a campaign were called prikases.

UKIAH, ū-kī'ą, Cal., city, county-seat of Mendocino County, on the Russian River and on the San Francisco and North Pacific Railroad, about 120 miles northwest of San Francisco. It was founded in 1857. It is in an agricultural and stock-raising region. The industries are connected chiefly with the cultivation and shipment of farm products, hops and fruit. Considerable lumber and livestock are shipped to other markets. The educational institutions are a high school opened in 1893, public and parochial schools. Pop. 2,136.

UKRAINE, or UKRAINIA ("borderland" or "march-land"), a great undetermined region in eastern Europe, embracing most of the southern part of Russia in Europe, East Galicia, Northwest Bukovina and Northeast Hungary. The territory may be regarded as a geographic unit standing on an equal basis with the regions known as Great Russia, North Russia, the Ural, White Russia and the Baltic provinces. During the early days of the Russian Revolution a Ukrainian Congress was opened at Kiev in April 1917, when the policy was adopted of national territorial autonomy within the future Russian Federal Republic. The boundaries of the new state were to be the Pripet on the north, the Black Sea and the Sea of Azov on the south, the Kuban River on the east and the provinces of Lublin and Grodno on the west. A Rada (central council) was formed, which issued a manifesto of autonomy in June 1917. The advent of Bolshevism altered the situation. On 20 Nov. 1917 the Rada proclaimed the Ukranian People's Republic, transferred the land to the peasants, defined the limits of the new state and defied the Bolsheviki. The new republic allied itself with Rumania, Bessarabia, the Donetz Cossacks and the anti-Bolshevik General Kaledin. In December Trotzky sent an ultimatum threatening war unless the Rada ceased to bar the passage of the Bolshevik troops. There was considerable fighting between the two forces, and on 8 Feb. 1918 the Bolsheviki claimed to be in military and political possession of Ukraine and that the Rada had ceased to exist. But that legislative body had sent a delegation to the Brest-Litovsk Peace Conference and had announced (11 Jan. 1918) that the Ukraine had resumed its international existence as an independent state. The delegation was ultimately recognized by Trotzky, but when it began negotiations for a separate peace with Germany and Austria, he protested and introduced some Soviet delegates from the Ukraine. The Austro-Germans, however, recognized the Rada delegates as representing an independent state, and at 2 A.M. on 9 Feb. 1918 the Central Powers signed peace with the Ukrainian republic.

Area and Population.— It is not possible as yet to define with any degree of exactitude the limits, area and population of the Ukraine. Authorities differ on the subject, and at the present time (August 1919) the republic is conducting a double war against the Poles and the Bolsheviki, the issue of which may result in territorial changes. The state roughly corresponds with the three divisions of southern Russia known as the Southwestern Territory, Little Russia and New Russia, excluding the territory of the Don Cossacks. According to the treaties of Paris (June 1919), which annulled the Brest-Litovsk and all other Russian treaties concluded by Germany since November 1917, the provisional boundaries of the Ukrainian republic were — on the north, the republic of White Russia; northeast, the Soviet or Bolshevik republic of Russia proper; east, the Don republic; south, the Sea of Azov, the Tauride (Crimean) republic and the Black Sea; southwest, the reconstituted kingdom of Rumania; west, the republics of Poland, Czecho-Slovakia and Hungary. It is divided into the governments of Chernigov, Ekaterinoslav (or Yekaterinoslav), Kharkov, Kherson, Kiev (Kieff), Podolia, Poltova, Taurida and Volhynia. These nine governments, cut out of what was Russian territory, cover an area of nearly 200,000 square miles. With the added territory taken from Galicia, Bukovina and Hungary, the total area of Ukraine reaches to about 328,200 square miles, of which the population is estimated at 33,000,000. Too much faith, however, should not be attached to these vital statistics, as "official" figures are either out of date or unreliable, being generally compiled in favor of the ruling race, while the estimates of private authorities differ considerably. In the first complete Russian census (1897) the total number of Ukrainians in the then Russian Empire was given as 22,400,000; an estimate in 1910 showed 28,900,000. In the former Austro-Hungarian Empire about 4,000,000 Ukrainians (nominally Ruthenians) dwelt in Galicia, Hungary and the Bukovina in 1910. There are, in addition, some 500,000 Ukrainians in the United States; 300,000 in Canada and over 50,000 in South America. Numerically, this race ranks sixth among the peoples of Europe, the five above them being the Germans, Russians, French, English and Italians. See RUTHENES.

Topography, Etc.— Ukraine covers a varied surface configuration, but on a large scale, not as in western or central Europe confined in a small area, for one may travel hundreds of miles in any direction without encountering any change of scenery. There are landscapes of high and central chains of mountains, picturesque hill districts and richly cut plateaus, marshy plains and steppes strewn with barrows. The closed group of plateaus extending from the foot of the Carpathians and the Polish part of the Vistula region to the Sea of Azov form the morphological nucleus of the Ukraine. To this group the names of Pontian Plateau and Avratinian Ridge are commonly but erroneously applied. This Ukrainian Plateau group (a more apposite title) is divided into the following sections: The Rostokh, between the San and Bug rivers; Volin or Volhynian, between the San and the Teterev; Podolia, between the Dniester and the Boh; the Pocutian, or Bessarabian Plateau, between the Dniester and the Pruth; the Dnieper Plateau, between the Boh and the Dnieper. The plateau character continues at the rapids section of the last-named river on the left bank where, at some distance, the last member of the plateau group lies — the Donetz Plateau. The plateau group is bordered on the north and south by two plain districts, the former consisting of adjoining lowlands — Pidlassye, Polissye and the Dnieper plain (with their extensions along the Donetz), and the latter of the long stretch of the Pontian

steppe-plain, which merges into the Caspian desert-steppe at the foot of the Caucasus. The Ukraine also takes in part of three European mountain systems — parts of the Carpathians, the little Yaila chain of Crimea and the western parts of the Caucasus. Altogether, more than nine-tenths of the whole territory is taken up by plains and plateaus; its western boundary extends beyond the defile of Poprad. The range of the Tatra is visible from the mountain country where the last Ukrainian villages lie. The territory reaches the Prislop Pass in the eastern part of the Carpathians, at that point where they are highest and most developed, though less than one-third of that mountain curve lies within Ukrainian national territory. It is only within the last 25 years that Ukrainian civilization spread to the Yaila Mountains of Crimea, three parallel ranges barely 100 miles long and separated by longitudinal valleys, along the southeast shores of the peninsula. The southern main range declines toward the sea in steep precipices, flat and rocky on top and intersected by deep gorges. The Caucasus forms the eastern boundary of the Ukraine and lies like a huge wall of rock between Europe and Asia.

Of the plateaus, the Podolian is the highest and most massive, though not lacking in fine scenery. Its surface is covered with a thick crust of loess, of which the uppermost layer has been transformed into the famous black earth (Chornozem) noted for its fertility. Centuries of exploitation has diminished the forests with the result that many springs and brooks have dried up and rivers have been almost obliterated, causing serious droughts in the hot, dry summers. The Pocutian-Bessarabian Plateau reaches the valleys of the Bistritza and Vorona in the sub-Carpathian region and passes over into the Pontian steppe-plain in the southeast. The western part (Pokutye) has a flat, undulating surface and a number of funnel-shaped depressions called Vertep (caves), famous for their beautiful stalactites of white alabaster. The southeastern or Bessarabian part is divided into narrow marshes by the flat valleys of the Pruth and Reut rivers. The Rostokh Plateau, also known as the Lemberg-Lublin Ridge, is a profusely cut, hilly, narrow plateau which merges on the south with the Podolian near Lemberg, where it becomes an erosive hill country. Toward the east it resolves itself into parallel hill ridges which gradually become lower and embrace marshy valleys. The soil is not very fertile owing to extensive sand and marl soil. The Volhynian Plateau is divided into several sections of different size by the swampy lowland of the Polissye. The surface soil is black soil only in the south, while many regions of loamy ground are rich in vegetable soil of considerable fertility. The hills have steep declines and flattened rocky peaks. The valleys of the rivers, broad, flat, with gentle slopes and marshy bottoms, differentiate the landscape from that of the Podolian, presenting a view of flat, wooded hills, slowly-flowing streams, marshes, marshy meadows and sandy ground. The Dnieper Plateau is parted into several sections by broad river valleys and broad depressions which traverse it. Its configuration is varied, rising south of Berdichiev to 1,000 feet, sinking constantly lower to the east and southeast by irregular stages. To the furthest west is a level plateau, where the tributaries of the Teterev, Irpen and Ross flow slowly in flat valleys through whole rows of ponds, entering the plain between steep granite banks. The declivity of the right bank of the Dnieper is torn by gorges, presenting the appearance of a chain of mountains. The aspect of Kiev and the Shevchenko barrow is one of the most beautiful in the whole country. Dropping constantly lower toward the southeast, the land rises again in the region of the source of the Samara and along the Donetz. Here begins the Donetz Plateau, the easternmost member of the group, stretching in a long flat ridge from N.W.W. to S.E.E. and extending a flat side-ridge to either side. The surface is level, declining flatly toward all sides and sprinkled with countless tumuli. The coalfields of the Donetz are the richest in what was once the Russian Empire. Here also are quicksilver mines and great deposits of rock-salt. A number of factories have sprung up in recent years. Zinc, lead, copper and gold are extracted.

The principal river system of the Ukraine concentrates in the Black Sea, which receives streams from north, northwest and east. The western boundaries of the country lie on the Baltic slope, while in recent times its colonization has reached parts of the Caspian slope on the Kuma and Terek rivers. The main river is the majestic Dnieper (1,300 miles), affectionately termed «Father Dnieper» and regarded as the symbol of the Ukraine, of its life and its past. During the spring floods all the islands, sand banks, swamps, meadows and river branches disappear beneath an interminable expanse of yellowish water, rolling slowly toward the south, leaving behind, as it recedes, a layer of fertile river mud. The Don River, of which less than a quarter lies within the Ukraine, was formerly an eastern border stream until the borders were extended into the Kuban region and to the Caspian Sea. Of the steppe rivers tending toward the Sea of Azov only the Yeia reaches its goal; the rest end their courses in lagoons. The Kuban (500 miles) receives many mountain streams from the northern Caucasus and carries its waters partly to the Black Sea and partly to the Sea of Azov, embracing the peninsula of Taman. Barely half of its course is navigable. The river Dniester (850 miles) possesses the greatest variety of distinct sections of river of all the Ukrainian streams. Rising in Galicia on the northeastern slope of the Carpathians, it receives numerous tributaries from that range and from Podolia — the Zlota Lipa, Stripa, Sereth, Zbruch, Smotrich, Uzhitsa, Murakhva, Yakhorlik, etc. Though navigable for about 500 miles of its course, the river has not become an important waterway. There are numerous smaller rivers, canals and streams, such as the Boh, Pripet, etc., besides lakes and lagoons, which form terminals for the weaker streams.

The Ukrainian climate is of a continental character, assuming an entirely independent character. The central European climatic zone ends at the western borders of the Ukraine, while the more rigorous eastern European continental climate, which obtains over all of White

Russia and Great Russia, covers only a small area in the northern Ukrainian territory. Winter is severe in the entire country, but far less variable than in central Europe or Russia. It is followed by a very short spring of about three weeks except in the northwest, where it is a little longer. The summer heat is considerable; May is as warm as July in England. Autumn is regularly very beautiful and comparatively warm, though as early as October warm, sunny days are followed by night frosts. In the Crimea, the sub-Caucasian country, southerly location and the proximity of the sea are apparent; winters are short and comparatively mild; the summer of five months with high temperature is followed by a long autumn. Mediterranean climatic conditions are found south of the Yaila and Caucasus Mountains. Here, on a narrow strip of land on the Black Sea the winter lasts less than a month; after a long spring follows a six months' summer, passing imperceptibly into a mild autumn. The dreariest climate is that of the Beskids and the Gorgani in the Ukrainian Carpathians, where a five months' winter and long periods of rainy weather in the spring and autumn encroach upon a short summer. Prevailing west winds bring Atlantic air into northern Ukraine; east winds in the south bear the influences of the Asiatic steppe climate, and sometimes increase to terrific snowstorms, causing great destruction to human and cattle life. Yet in November and December moist, warm south winds frequently come up from the Pontus, but the freezing east winds referred to predominate and are responsible for the severe winters in that region. East and south winds in the spring frequently bring heavy sandstorms which injure the crops. In the summer, however, west, southwest and northwest winds prevail, carrying moist Atlantic air and rain into the entire country. Rainfall is less than in central or western Europe, being greatest in the mountain districts. The heaviest falls occur in June.

Consult the invaluable works of Prof. Stephen Rudnitsky, the eminent geographer of the University of Lemberg, Prof. M. Hrushevsky, president of the Ukrainian Rada and the publications of the Ukrainian National Association and of the Ruthenian National Union, both of New York, for material not elsewhere accessible.

Flora and Fauna.— The plant and animal geography of Ukrainia is more varied than that of Russia, for within its borders the three main divisions of European plant geography meet — the Mediterranean division, the steppe region and the forest region, and three mountain regions. Forests cover barely one-fifth of the country — only the northern and northwestern borderlands, where many swamp forests are to be found. In the forest region are also luxurious meadows with thick grass and tree clusters, stretching through wide, flat river valleys. In the swamps regular moors, made up of peat mosses, alternate with meadow moors in which swamp grass and herb vegetation predominate. Practically all the rest of the Ukraine is occupied by the steppe region, down to the foothills of the Yaila and the Caucasus. The fertile black earth region extends longitudinally through the country, over three-fourths of its area. On the Sea of Azov and in southern Crimea the brown dry steppe soil, with islands of saline soil and a peculiar vegetation, inclined to absorb salt, prevails. These also occur elsewhere along the rivers and the seashore. Grasses and herbs predominate on the meadow steppes, the former of the *stippa* species and the other of a lily-like growth. Grass is luxuriant and abundant in the northern part of the steppe region, while high weeds and thistles form dense thickets. In spring the steppe presents the appearance of a gorgeous flower carpet, but the colors soon fade into brown and yellow under heat and drought. This type of vegetation is thinner in the south. Terraces of trees are found along river valleys, and forests of oak, maple, poplar, white beech, wild apple and pear trees are studded over the steppes. The ancient Ukrainians of the Kiev state rooted out great areas of forest and reclaimed the land for civilization. Greater variety of vegetation is found in the Carpathians, though in regard to flora the country possesses but few endemic species. The fauna differs slightly from that of the rest of Europe. Many species which were dangerous as beasts of prey or useful for food or skins have either been entirely exterminated by man or greatly limited in their multiplication. In the 16th century the Ukraine was so rich in bison, wild horses and deer that these were hunted merely for the sake of their skins, and only the choicest of the flesh retained. The wild horses that once roamed over the steppes in great herds are extinct; the Sagai antelopes have retreated to the Caspian steppe; the once ubiquitous bear is now confined to the Carpathians, Caucasus and the Polissye country, in which regions the lynx and wildcat are also found. Throughout the country all sorts of smaller predatory animals have survived, such as wolves, foxes, badgers, martens, polecats. Of the large herbivora the bison has survived in the forest of Biloveza under government protection; the stag only in the Carpathians and the Caucasus, and the moose-deer only in Polissye. In the woods are still many boars and roes. The beaver, formerly found on every river in the country, has now retreated to the most inaccessible swamps. Eagles and hawks exist only in the two great ranges; grouse and heath fowl hide in the dense thickets; cranes and herons are rare; water fowl, wild ducks, geese, coot and diving birds are still very numerous. Owing to the absence of scientific pisciculture the former wealth of fish has greatly diminished. Yet much fish is still taken — mainly pike, tench, carp, crucian, shad, etc. Sturgeon, sterlet and other sea fish which formerly came in great swarms up the Dnieper, Dniester and Boh rivers are seldom found to-day.

The domestic animals are the same as in central Europe. Only in the extreme south camels and buffaloes are added. The horned cattle belong chiefly to the so-called Ukrainian breed, distinguished by its gray color and its size, bony and strong-limbed. Hungarian cattle is widely distributed on the southwest borders. In recent years pure Dutch, Swiss and Tyrol breeds have been spread. The finest horses, the Ukrainian, have been raised by the Zaporog Cossacks and are noted for strength, speed and adaptability for all kinds of work. The Chornomoric variety is raised by the Kuban Cos-

sacks and is prized throughout eastern Europe for its high qualities. Another breed, the Hutzulian mountain horse, possesses great strength though of small stature, and is unsurpassed for mountain roads. The peasant horses of Galicia, Podolia and Volhynia especially, despite their somewhat clumsy appearance, are particularly adapted for the rough roads of their land. Donkeys and mules are rare, and very few goats are kept. In sheep the Ukraine, thanks to vast pastures, is the richest country in Europe. Besides the native breeds, foreign merino sheep are raised, especially on the steppes. Hogs are raised in great numbers, the Polish, Russian and native varieties. In barnyard fowl the Ukraine is the richest land in eastern Europe. Much honey is also produced, besides mulberry leaves, though the silkworm industry is unimportant.

Ethnography.— The Ukrainians are a Slav race which diverged from the common stock at a very early period and developed during the centuries into an entirely independent Slav nation, just as Poles, Czechs, Serbs and Bulgars have done. Of that great family the Ukrainians form the second largest branch. Their nearest relations are the Ruthenes (q.v.), who are true Ukrainians who had long been incorporated in the Austrian Empire and lived under Hapsburg and Hungarian rule, but temporarily reunited with the mother-country as a result of the European War. The old Ukrainian Empire of Kiev was as old as the Holy Roman Empire of the German nation, but while the political evolution of the western European nations was proceeding, the Ukrainians were hindered by reason of their geographical situation at the western portals of Asia, where they were subject to Mongolian invasion. Though a mixed race, its formation took place in a distant prehistoric past, while later admixtures were too insignificant to change the type materially. From the Vislok to the Kuban and from the Pripet to the Black Sea, the Ukrainian people constitute a uniform anthropological type, which has preserved itself in its purest state in one wide zone embracing the Ukrainian Carpathian lands, Pokutye, Podolia, the Dnieper Plateau and Plain, the Donetz Plateau and the Kuban sub-Caucasus country. Tall of stature, with long legs and broad shoulders, strongly tinted complexions, dark, thick, curly hair, rounded head and long face with a high and broad brow, dark eyes, straight nose, medium mouth and small ears, with strongly developed lower face — these characteristics differentiate the Ukrainians from their neighbors, especially the White and Great Russians and the Poles. They are among the tallest peoples of Europe; the finest physical types are those of the Kuban and sub-Caucasus, descended from the Zaporog Cossacks, who for centuries represented the flower of the people's strength. Under the old régime many of the Russian Ukrainians were enrolled in the guard regiments of the tsars. See SLAVS.

Language and Literature.— There had long been an impression that the Ukrainian language was a rural dialect of Polish, while Russian bureaucracy consistently encouraged the view that it was merely a Little Russian dialect of the Great Russian language. In recent times, however, the more scientific philologists have arrived at the conclusion that Ukrainian is not a dialect of Russian, but an independent language of equal rank with Russian, related thereto just as Bulgarian or Serbian, Polish or Bohemian. Two close analogies may be found in the Latin and Teutonic languages, e.g., Spanish and Rumanian are Latin languages, but are not Latin dialects; Flemish, Swedish and Dutch are Teutonic languages, but not German "dialects." When the first Duma in 1905 removed the restrictions on Little Russian publications which had been imposed in 1876, the Saint Petersburg Academy of Sciences emphatically declared that the two were independent languages of equal rank, as, for instance, English and French. To the Ukrainian, Russian is a foreign tongue and difficult to acquire. There are four dialects of Ukrainian — the North and South Ukrainian, the Galician or Red Russian and the Carpathian Mountain dialect. These are again subdivided into idioms, of which the North contains four, the South three, the Galician two and the Carpathian four, though all of them differ but little from each other. Despite many years of rigorous suppression, the Ukrainian language has been kept alive in all its richness, flexibility, euphony, comparative purity and wide range of expression.

Among Slavonic literatures only those of the Russians and Poles surpass the Ukrainian, which possesses a large store of popular poetry, epic folklore and pre-Christian religious and secular songs. This literature has been built up during nearly a thousand years, dating from the flourishing days of the Kiev Empire and surviving through five centuries of unremitting struggle against Tatar barbarism. Yet from those dark ages there remain legal, theological, philosophical, polemic and even dramatic monuments of literature composed in a jumbled macaronic language of mixed Church-Slavonic and Ukrainian. The impetus for a revival of Ukrainian literature was given by Kotlarevsky in 1798 through introducing the pure popular speech in his writings. A large number of poets and prose writers rose to more than local fame during the 19th century, chief among them being Kobylanska, Stefanyk, Vovchok, Shevchenko, Kulish, Fedkovich, Franko, Mirni, Kotsiubinsky and Vinnichenko. Science has also made considerable progress, as also have history, geography and philosophy, while two learned societies have been established at Lemberg and Kiev. The circulation of Ukrainian literature was forbidden by former Russian governments in the territories under their rule.

Agriculture.— Nearly 90 per cent of the people are engaged in agriculture in the Ukraine, which is fitted by nature to be one of the most valuable food-producing regions in the world. Owing to lack of education in scientific methods, however, agriculture is still in a very backward condition. Better conditions prevail in the western borderlands, where regular rotations of crops, artificial fertilizing and improved machinery have considerably raised the volume of produce with less expenditure of human energy. Agricultural co-operative associations are spreading branches over the country and performing useful work to raise the level of husbandry by means of tuition, advice and assistance. Under foreign rule much of the

land has accumulated in the hands of alien landowners, while the native peasant had perforce to be content with the less valuable "leavings." While the great landlords grew wealthier the peasants grew poorer and were for many years compelled to seek homes elsewhere, in Siberia, Turkestan, Caucasia and further afield in the American continents. The Russian community system of land ownership existing in parts has not proved conducive to encouraging labor on land which the actual tiller cannot call his own. Despite all these obstacles the Ukraine remains the greatest grain-producing country of Europe, excepting Russia. Wheat, rye, barley, oats, buckwheat, millet, Indian corn, beans, lentils, fodder, hemp, flax, sunflowers, rapeseed, poppy, sugar-beet in enormous quantities, tobacco, all kinds of vegetables and fruits, grape-vine in parts, etc., are raised in the Ukraine, besides which there is also a flourishing cattle-raising industry. See *Flora and Fauna.*

Minerals, Etc.— Some mention has been made of mineral deposits found in Ukraine. (See *Topography*). The more important items are iron, mercury and manganese. The only important coalfield is situated in the Donetz Plateau, and is one of the largest and richest in Europe. In petroleum and ozokerite the Ukraine is richer than any other European country. There are large peat deposits awaiting exploitation; salt production has grown to great proportions from the immense deposits in salt springs and lakes and mines of pure rock-salt. Other natural treasures include phosphorites, containing from 70 to 75 per cent phosphoric acid; kaolin or porcelain clay and fireproof clays; slate, lithographic stone, mineral paints, sulphur, pumice-stone, mill-stones, whetstones, chalk, gypsum, building stones, Devonian sandstone and granite gneisses, etc.

Manufactures.— Until recent years home industries predominated in the Ukraine, weaving being the most important. The steady encroachment of the factory system and introduction of machinery are gradually displacing many of the domestic industries, though among the latter that of producing cloth, woolens, linen, carpets, tapestries, etc., is still carried on throughout the country, where weavers may be found in almost every village, especially in Galicia. Rope, cordage and nets are produced in large quantities, while the wood-working industry comes second to the textile craft in magnitude. It includes carpentering, cabinet-making, cooperage, shipbuilding, wagon-building, turning, carving, ornamental boxes and picture-frame making. Basket-weaving, shoemaking, pottery, brick-making, stone-cutting and metal working are trades located in districts where the soil provides the raw materials. Leather is abundant and prepared in flourishing tanneries; horn combs, buttons and other small articles are made for export as well as home consumption. There are also numerous families devoted to painting sacred pictures. Among the many other branches of industries are those of petroleum refining, sugar manufacturing and refining alcohol distillation, beer brewing, milling, cotton and hemp production; lumber, iron and steel, cement, tiles, matches, cork and paper are worked or manufactured to a large extent by foreign capitalists.

The trade and commerce of the Ukraine are still in a backward condition; what there is rests almost exclusively in foreign hands, Russians, Greeks, Armenians and Jews. Native competition against these more expert traders is as yet out of the question owing to the absence of educational opportunities. Another powerful drawback is the primitive condition of the means of communication in eastern Europe, which restricts or localizes most of the trade to small annual fairs, of which some 4,000 are held. The paucity of railroads and the bad state of the public highways render transport slow and difficult for horses and carts. Within recent years, however, some attempts at commercial organization have been made by the creation of exchanges and chambers of commerce in the principal centres to promote the exportation of raw materials. Since home industry covers the greatest part of domestic demand, the extent of foreign imports of manufactured goods is very small compared with the great export of foodstuffs which crosses the Ukrainian borders. Under the Russian régime the national resources of the Ukraine were exported in enormous quantities to other parts of the empire, while the Ukraine region was flooded with the inferior goods of central Russian industry. At the same time an annual customs balance of about $100,000,000 went to the central government from the Ukraine to be used for the development of the central provinces. In addition to this serious drain the Ukraine raised about one-third of Russia's total cattle supply, five-sixths of the empire's total sugar-beet output, 60 per cent of the whole coal production and one-sixth of the world's manganese supply. Yet with all this boundless natural wealth which his country provided, the Ukrainian peasant was left in grinding poverty, illiteracy and lack of proper clothing; he supplied the necessary manual labor in return for a pittance inadequate to maintain a decent existence. Centuries of oppression and political dependence resulted only in hindering the material and spiritual development of one of the naturally wealthiest countries in the world.

Cities, Towns and Settlements.— The largest city and most important seaport of the Ukraine is Odessa (q.v.), situated on a deep, open roadstead 20 miles north of the Dniester outlet. Kiev (q.v.), with over 500,000 inhabitants, comes next. It was the capital of the ancient Ukrainian kingdom and its spiritual centre; it is still called the Jerusalem of the nation. Other populous settlements are Kharkov, Chernigov, Ekaterinoslav and Zhitomir. See RUSSIA; GALICIA; POLAND.

History.— The historical life of the Ukrainian nation has differed entirely from that of the Russians or the Poles. Its roots lie in the ancient kingdom of Kiev, called "Old Russia" in the history books, and which formed a state erected by the southern group of the Eastern Slavic races, particularly by the Polan race around Kiev. A government existed early in the 9th century, and in 988 A.D. Greek Christianity was accepted by Vladimir the Great, the "Great Prince of Kiev," and all his peoples. From this period began a great advance in the material and intellectual civilization of the people; a high degree of commercial prosperity was attained while as yet the Russian lands lay wholly undeveloped. From Kiev Christianity

spread northward and eastward. During the 13th century the Tatar invasion under Genghiz Khan brought disaster to Ukrainia: Kiev and other cities fell in flames, the plains were desolated and thousands of the people were carried into captivity. Of the remainder, those who were not killed either starved to death or sought refuge in Galicia. After the barbarian wave receded, the fugitives or their descendants returned to their motherland, but in the meantime other Slav states had risen on the north. These latter coveted the fertile plains of the south and possessed the strength to bring them under their sway. The first of these states to exercise control over Ukrainia was Lithuania (q.v.), which ruled the land for 200 years, not without some justice and moderation. After 1569, however, Lithuania became united with Poland, and with the advent of the latter state to a predominant position in the union, the sorrows of the Ukraine increased under oppression and led to the inevitable revolt. Though Poland ruled with an iron rod, she was too weak, even together with Lithuania, to defend the Ukrainians against the sporadic raids of the Tatars, who issued from the Crimea, carried devastation as far as Galicia and Volhynia, and depopulated the region by the seizure of slaves and slaughter. This perennial warfare on the border forced the Ukrainians to take independent defensive measures. The farmers, hunters and fishermen on the marshy borders carried arms and led a precarious, half-industrial, half-military existence. They called themselves Kazaks (Cossacks), i.e., free warriors. These Ukrainian Cossacks created a military state organization in the 16th century around a strongly fortified position below the rapids of the Dnieper, the Zaporog Sich. Some notable features distinguished the Zaporog warrior state — absolute, democratic equality, obligatory celibacy and duly elected officials. In wartime unlimited power was vested in the highest official, the ataman or hetman, who then for the time being exerted the dictatorial sway of an autocrat. The Zaporog Cossacks were regarded by the entire Ukrainian people as their natural defenders alike against Tatar marauder and Polish political taskmaster. About the middle of the 17th century there was born the "Ukrainian problem" which lasted until near the close of the great European War in 1918. Toward the end of the 16th century the prevailing discontent led to a number of Cossack insurrections, culminating in the great Ukrainian revolution in 1648. After 100 years' constant struggle for liberation the Ukrainians threw off the Polish yoke, led by their hetman, the doughty Bogdan Khmelnyzki. Feeling itself unable to stand alone, the Ukrainian National Council (the Rada) made a treaty in 1654 with the Tsar Alexis of Muscovy, father of Peter the Great. That treaty brought the Ukrainians, figuratively speaking, out of the Polish frying-pan into the Russian fire, wherein they remained over 250 years. The treaty provided that the Ukraine should retain complete autonomy as well as their Cossack organization, the latter under their duly-elected hetman, with the right to conduct an independent foreign policy, while the military should stand under Russian suzerainty. But if the Ukrainian democratic ideals and form of government had been formerly obnoxious to aristocratic Poland, they were a still greater abomination to autocratic Russia. Three years after the signing of the treaty the liberator hetman died (1657) and Russia took the first steps toward crushing the national sentiments of the Ukrainian people and obliterating their democratic institutions. The incompetence of successive hetmans, jealousy and prejudice among Cossack officers, and the animosity of the poorer classes against the wealthy opened wide breaches into the national solidarity, which Russian officialdom did not fail to profit by. The autonomy of the Ukraine was gradually whittled away until, by the Peace of Andrussovo in 1667 with Poland, the country was split into two portions, one, that nearest to Poland, was ceded to that country, and the other, east of the Dnieper, was suppressed with unspeakable ferocity by Peter the Great after the failure of Mazeppa and the battle of Poltava. Ukrainia, as a nation, ceased to exist; the Zaporog Sich managed to exist till 1775, when it was destroyed; the people became serfs under the process of Russification and repression — a fate which also befell Poland a few years later, when the whole of that country, with the exception of Eastern Galicia and the Bukovina, which fell to Austria, was absorbed by Russia (1795). From this division of the country rose a dual Ukrainian problem — that of the Ukrainians under Russia and of the remainder under Austria, in which latter they fell under the domination of the Polish element in Galicia. Here even the name "Ukrainians" was superseded by that of "Ruthenes" (q.v.). In Russian territory the Ukrainians were officially designated as Russians and their language as a *patois* of Russian.

From this stage the history of the two severed portions of the Ukraine form part of the history of Russia or of Austria. But about the middle of the 19th century the Austrian government adopted a new attitude toward Galicia, intended to check Polish preponderance and to reduce the pressure of Russia on the east. This policy consisted in encouraging the ideal of Ukrainian independence, with the object of creating a powerful or at least a large buffer state by reviving the Ukrainian nation, in other words, uniting the Ruthenes with their brethren on Russian territory. Ruthenianism was fostered in Galicia by the foundation of professorships at Lemberg and the wholesale production of Ukrainian propaganda literature, which was circulated on the Russian side of the frontier. Toward the end of the 19th century the Ruthenians came to blows with their Polish overlords in Galicia, a conflict which the Austrian government could do little to suppress. In 1902 a general strike of Ruthenians broke out with the demand that Eastern Galicia be constituted a separate Ukrainian province. The Russian revolution of 1905 strengthened the movement against Polish suppression, and in 1908 the Polish governor of Galicia was shot dead by a Ukrainian student, who afterward escaped to the United States. Early in the European War the Russians overran Galicia and began the Russification of the territory by making the Russian language obligatory and forbidding the Ukrainian. In the following year, however, the Russians were expelled from Galicia by the Austro-German armies under Von Mackensen and the Central Powers made a bid for Polish support — Poland being also occupied by

them — with the promise of a reunited Poland under Austro-German patronage. This prospect alarmed the Ukrainians and led them to strive anew for independence. The Russian revolution of 1917, which swept away the Romanoff dynasty and finally developed into the greatest disorder under Bolshevism, gave them their opportunity. A national assembly, the Rada, was convened at Kiev, the old capital, in April 1917, and advocated a union with free Russia on a federal basis. Lvov and Kerensky, for the short time they were in power, opposed the plan. With the advent of Lenin and Trotzky, however, the Ukraine broke loose altogether from Russia, though maintaining a sympathetic connection with the Russian people struggling to found a genuine democracy. The Central Powers, being desirous of breaking up Russia, aided the Ukrainian movement, with the result that the Ukrainian nation was recognized as an independent state, which finally concluded a separate peace with Germany and Austria. Poland was not represented at Brest-Litovsk; her independence had been an article of faith of the Russian provisional government, while her self-determination was the policy of the Bolsheviki. The Ukrainians were divided on two distinct ideals. Their large peasant population was chiefly anxious to acquire the land from the great Polish proprietors, while in the towns there existed a strong intelligent nationalism. But the Bolsheviki were opposed to both desires. As Socialists they objected to the individualist peasant proprietors, and as centralists or internationalists they had little sympathy with provincial chauvinism. On 20 Nov. 1917 the Rada issued a proclamation, transferring the land to the peasants, establishing an eight-hour day, giving labor the control over industry and defining the frontiers of the republic. This bold attempt to forestall Bolshevism succeeded for the moment. The Ukrainians allied themselves with General Kaledin and the Cossacks of the Donetz basin, and with Rumania and Bessarabia. They occupied Odessa and fought steadily against the rising tide of Bolshevist troops. In December 1917 Trotzky sent them an ultimatum threatening war unless they ceased to bar the forces of Bolshevism, to which the Rada replied that they could not tolerate the interference of Bolshevik elements in their national government.

The collapse of Austria liberated the Ruthenians, who hastened to unite with their kindred over the Russian border, a program that was distasteful to the Polish nobility. With the Ukrainian occupation of Eastern Galicia a war broke out between them. The Poles recaptured Lemberg, which city was again besieged by the Ukrainians in January 1919. During March the Ukrainians again occupied Lemberg after several days' hard fighting and a siege of three months; they had captured Przemysl on the 18th and brought up their heavy guns to reduce Lemberg. The Ukrainians, headed by General Petlura, sought alliance with the Entente Powers to save them from Poles and Bolsheviki alike. The advance of the Bolshevist hosts upon Odessa during May was carried on with murder and rapine, turning the rich agricultural districts of the Ukraine into a wilderness. The rule of Bolshevism was introduced, with nationalization, confiscation and outrage. Instead of the Ukraine supplying the rest of Russia with grain, as Lenin had intended, that country was itself brought to the verge of famine. The Poles demanded that the new Poland should include Eastern Galicia on the ground that at least 35 per cent of the soil was owned by Poles. The natives objected that this ownership dated from feudal times and was manifestly unjust, seeing that the Ukrainian population was by far preponderant in the country. Early in June 1919, however, the Peace Conference authorized the military occupation of Eastern Galicia by Poland, "after having fixed with the Allied and Associated Powers an agreement whose clauses shall guarantee so far as possible the autonomy of this territory, and the political and religious liberty of its inhabitants. This agreement shall be based on the right of free disposition, which, in the last resort, the inhabitants of Eastern Galicia are to exercise regarding their political allegiance." The motive prompting the Conference appears to have been that of uniting millions of Ukrainians with Poland and Czecho-Slovakia, with a view to later junction with Rumania, thereby creating a great barrier between Germany and Russia in the future. The ancient title of hetman had been revived in May 1918 and conferred upon General Skoropadsky, a former general in the imperial Russian army. His attempt to hold the Ukraine for Russia with German aid failed. The National Union raised a volunteer army of 60,000 men and overthrew Skoropadsky. In August 1919 the Ukraine ceded Eastern Galicia to Poland and in September the anti-Bolshevist General Denikine recaptured Kiev for the Ukraine. Two months later the city fell again into the hands of the Soviet forces.

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ULADISŁAS, or VLADISLAS, kings of Poland. There were seven monarchs of this name.

ULCER is a suppurating sore produced by the destruction of some part of the living structure, leaving a hollow from which matter is discharged. Ulcers may be either internal or external. They may be arranged either according to the constitutional or specific disease from which they are derived or according to the characters which they present. According to the first system ulcers are spoken of as healthy, inflammatory, strumous, etc.; while according to the second they are named irritable, chronic, sloughing, etc. A common, simple or healthy ulcer is such as is left after the separation of an accidental slough in a healthy person, and is merely a healthy granulating surface tending to cicatrization. Its edges shelve gently down to the base, and are scarcely harder than the adjacent healthy skin. Their surface near the borders is of a purplish blue tint where the young epidermis modifies the color of the healing granulations and within this the granulations have a deeper hue than those at the centre, being most vascular where the cuticle is being chiefly developed. The discharge from such an ulcer is healthy or laudable pus. The only treatment required is a little dry lint, if there is much discharge, or the water dressing, if the sore is comparatively dry. When the granulations are too luxuriant they must be touched with nitrate of silver and dressed with dry lint.

Inflammatory ulcers differ less than most kinds from healthy ulcers. They commonly arise from some trifling injury, such as a blow or slight abrasion of the skin, which to a healthy person would have done no harm. Their most common seat is on the lower half of the leg or shin. The surface is red and bleeds easily; the discharge is thin and watery; the edges irregular or shreddy; and the surrounding skin shows a red tinge, and is the seat of a hot and aching sensation. This ulcer most commonly occurs in the infirm and old, the ill-fed and overworked. Hence constitutional treatment, good diet and complete rest (with elevation of the limb) are here demanded in addition to a water dressing or lead lotion applied warm. Senile ulcers usually present very little discharge, exhibit granulations of a rusty red tint and are surrounded by a dusky red area. Nourishing food, wine, bark and the mineral acids are here required, and opium in small repeated doses is often serviceable. The local treatment must be of a stimulating nature, and in bad cases strapping the leg daily with a mixture of resin ointment and Peruvian balsam spread on strips of lint is recommended. Strumous or scrofulous ulcers usually occur as the consequence of scrofulous inflammation in the subcutaneous tissue or lymphatic glands. They most commonly occur in the neck, groins, cheeks, scalp and the neighborhood of the larger joints. The discharge is thin and of a greenish-yellow tint. These ulcers are seldom very sensitive or painful. The general treatment must be that recommended for constitutional scrofula. Iodine in some form or other is the best local application. A poultice of bruised and warmed seaweed is a very popular remedy; but there is probably nothing so efficacious as tincture of iodine diluted with water till it causes only a slight discomfort, and applied three or four times a day. Consult Adams, E., 'Treatment of Chronic Leg Ulcers' (New York 1914); Da Costa, J. C., 'Modern Surgery' (7th ed., Philadelphia 1914); Foote, E. M., 'Textbook of Minor Surgery' (New York 1914).

ULEABORG, oo'lyĕ-â-borg, Finland, town and capital of a government of the same name, at the mouth of the Uleå, on the northeast shore of the Gulf of Bothnia, 498 miles by rail north of Helsingfors. It has some manufactures and carries on a trade in timber, butter, grain, coal, iron, salt, raw hides, etc. Pop. 21,000.

ULEMA, the learned, knowing or wise: collective name of the body of theologians and legists in Mohammedan countries; the word is Arabic and the plural form of *alim,* learned, wise. The Ulema constitute the legal and judicial class and are interpreters of the Koran and of the laws derived therefrom; they are in Islam in a measure the counterpart of a hierarchy in a Christian monarchy, and are the principal check upon the irresponsible power of the sovereign. Every Mohammedan city has a body or Ulema, but the most renowned are the Ulema of Constantinople, of Mecca and of the Azhat University of Cairo. The Ulema of Turkey have the best organization, and enjoy many privileges and immunities. The classes of scholars and officials among the Ulema are the Imâms, or readers of the public prayers in the mosques; the Mûftis, or doctors of the law, who act either as advocates or as assessors in the courts; the Kâdis or Mollas, who are the regular judges; they are subordinate to two Chief Kâdis, one for the European, the other for the Asiatic provinces; over them all presides the Sheikh-ul-Islâm, spiritual head, under the caliph, of orthodox Mohammedanism.

ULEX. See FURZE.

ULEXITE, a mineral occurring in white, crudely spherical masses composed of fine fibres, having a silky lustre. It is very soft and light, its hardness being only 1, and specific gravity 1.65. It is a hydrous sodium and calcium borate, $NaCaB_5O_6.8H_2O$. It occurs in large quantities in Chile and Argentina, also abundantly in the salt marshes of Nevada and California. It is one of the commonest sources of borax.

ULFILAS, ULPHILAS, or **WULFILAS,** bishop of the Goths: b. north of the Danube, about 311; d. Constantinople, 383. He was consecrated bishop by Eusebius of Nicomedia, probably at Antioch, in 341; and though his native language was Gothic, he learned to speak and write Greek and Latin. Like all the Goths he was an Arian, and was called to Constantinople by the Emperor Theodosius shortly before his death to attend a conference or controversy on disputed matters of faith. His claim to renown is based upon the fact that he translated into his own tongue the whole Bible, with the exception of the books of Kings, which he deemed too warlike for his inflammable Goths. He seems to have invented the Gothic alphabet, which is evidently based on the Greek. He employed the Septuagint for the Old Testament, and a Greek text, different from the received text, for the New. His translation is faithful, but not slavish. It was generally used by the Goths who migrated to Spain and Italy, but the Gothic language hav-

ing died out in southern Europe it was entirely lost and only some fragments have been preserved. These consist of the greater part of the Gospels and epistles of Saint Paul, fragments of Ezra, Nehemiah, Genesis and of a psalm. The chief manuscript is preserved at the University of Upsala. There are editions of Gabelentz and Löbe (Leipzig 1843–46), Heyne (1896), Balg (1891), etc. This Gothic work is of the highest importance to the student of philology. (See GOTHIC; GOTHS). Consult Uppström, 'Codex Argenteus,' a facsimile (Upsala 1857); 'Fragmenta Gothica Selecta' (ib. 1861); 'Codices Gothic Ambrosiani' (Stockholm 1868). Consult also Bessell, W., 'Ueber das Leben des Ulfilas und die Bekehrung der Goten zum Christentum' (Göttingen 1860); 'Cambridge Mediæval History' (New York 1911) and Scott, C. A., 'Ulfilas: Apostle of the Goths' (London 1885).

ULLOA, ool-yō'ä, **Antonio de,** Spanish scientist and naval officer: b. Seville, Spain, 12 Jan. 1716; d. near Cadiz, Spain, 5 July 1795. He entered the navy when very young and in 1735 was appointed with Jorge Juan a member of the French scientific expedition to Peru. They were engaged for nine years in making surveys of the country, and in studying the history and social conditions of the inhabitants, upon which they made a secret report to the Spanish government. This document is of great historical value as showing the abuses which later resulted in the Revolution and was later published in English under the title 'Secret Information Concerning America' (1826). Ulloa was captured by the British on his return trip in 1744, but was shortly released and returning to Spain became prominent among Spanish scientists. He founded the first metallurgical laboratory in Spain and also established the observatory at Cadiz. He was appointed to various political offices of importance, and in 1766–68 was governor of Louisiana. He published 'Relación histórica del viaje á la América meridional' (1748); and 'Noticias Americanas' (Madrid 1772).

ULLOA, Francisco de, Spanish soldier and explorer in the New World: d. about 1540. He accompanied Cortes (q.v.) in the conquest of Mexico, and was sent by that commander (July 1539) to explore the Gulf of California. With three ships, one of which he lost in bad weather, he sailed from Acapulco for the Gulf. He was the first to establish the fact that Lower California is a peninsula. He ascended to the upper waters of the Gulf, explored the western coast of the peninsula and reached, by some accounts, lat. 30° 30′ N., by others only 28°. Statements as to his death are conflicting.

ULM, oolm, Württemberg, town situated 45 miles south-southeast of Stuttgart, on the left bank of the Danube and on both sides of the Blau, here crossed by five bridges. A bridge across the Danube connects with Neu-Ulm. It is a place of considerable strength, being provided with important defenses on both sides of the Danube. It is an old town, irregularly built, with narrow, winding streets. It has a cathedral in the old Gothic style, with spire 530 feet high, completed in 1890; manufactures of machinery, woolen and linen cloth, leather, ships, boats, pipes, pastry, paper, brassware, etc.; and an important trade. Ulm was long an imperial free town. It forms an important military position, and its possession has been keenly contested in every great European war, except that of 1914–18. The capitulation of Ulm, 17 Oct. 1805, was the turning-point of the campaign of Austerlitz. Pop. 56,100. Consult Loeffler, 'Geschichte der Festung Ulm' (Ulm 1883) and Schultes, 'Chronik von Ulm' (ib. 1886).

ULMANN, Albert, American author and stockbroker: b. New York, 2 July 1861. He was graduated from the College of the City of New York in 1881, and has been a member of the New York Stock Exchange from 1899. He has published 'Frederick Struther's Romance' (1889); 'Chaperoned' (1894); 'A Landmark History of New York' (1901); 'New York's Historic Sites' (1902); 'History of Maiden Lane' (1911); 'Tales of Old New York,' with Grace C. Strachan (1914), also editor of 'Historical Guide to the City of New York' (1909).

ULNA. See ARM; OSTEOLOGY.

ULPIANUS, ŭl-pĭ-ā'nŭs, **Domitius,** Roman jurist: b. Tyre, Phœnicia, about 170 A.D. His public life at Rome began under Septimius Severus, first as assessor to the prætor (Papinian), and afterward as *præfectus prætori* under Alexander Severus (222). He was murdered before the eyes of the emperor, whose adviser and mouthpiece he had been, by the Prætorian guard which he commanded (228). He was a voluminous writer and extracts from his writings form one-third of the 'Pandects' of Justinian, who makes 2,462 extracts from Ulpian. His chief works, 'Ad Edictum' and 'Ad Sabinum,' are only extant in fragments. Consult Hugo, 'Tituli ex Corpore Ulpiani' (1834); and Abdy and Walker, 'The Commentaries of Gaius and the Rules of Ulpian' (3d ed., Cambridge, England, 1885).

ULRICH, ŭl'rĭk, **Charles Frederic,** American artist: b. New York, 18 Oct. 1858; d. New York, 15 May 1908. He began the study of his profession at Cooper Institute and the National Academy. In 1879 he was awarded a medal at Munich, where he had been a pupil under notable artists for some time. He subsequently settled in New York, but in 1884 removed to Italy. His best-known pictures include 'In the Land of Promise'; 'The Glass Blowers'; 'The Wood Engraver'; 'The Carpenter'; 'The Waifs'; 'A Dutch Typesetter'; 'Washing of Feet in the Venice Cathedral' and 'Glass Blowers of Murano,' now in the Metropolitan Museum, New York City.

ULRICH, Edward Oscar, American geologist: b. Cincinnati, Ohio, 1 Feb. 1851. He was educated for a physician but abandoned medicine to become curator of the Cincinnati Society of Natural History (1877–81) and later was paleontologist to the surveys of Illinois, Minnesota and Ohio. After 1897 he was geologist of the United States Geological Survey. He also was associate editor of the *American Geologist* and author of many learned essays.

ULRICH VON LICHTENSTEIN, early German poet: b. Styria, about 1199; d. 1276. His chief work is entitled 'Frauendienst' and is valuable only as a history of the times. Con-

sult Becker's 'Wahrheit und dichtung in Ulrich von Lichtensteins Frauendienst' (Halle 1888).

ULRICI, ool-rē't'sē, **Hermann,** German philosopher and critic: b. Pförte, Saxony, 23 March 1806; d. Halle, Prussia, 11 Jan. 1884. He studied law, but from 1829 gave himself to philosophical study and became professor of philosophy at the University of Halle in 1834. He published 'Characteristics of Ancient Historiography' (1883); 'History of Poetic Art in Greece' (1835); 'Treatise on Shakespeare's Dramatic Art' (1839), a work much prized by Shakespearean students; 'On the Principle and Method of Hegel's Philosophy' (1841); 'Ground Principles of Philosophy' (1845); 'System of Logic' (1852); 'Glauben und Wissen' (1858); 'God and Nature' (1862); 'God and Man' (1866).

ULSTER, Ireland (Irish, *Uladh,* Latinized, *Ultonia*), the most northerly of the four provinces, comprehending the counties of Antrim, Armagh, Cavan, Donegal, Down, Fermanagh, Londonderry, Monaghan and Tyrone. Area, 8,613 square miles. At a very early period Ulster was a provincial kingdom and its southern boundary was farther south than it is to-day. The O'Neills and O'Donnells were the princely families of Ulster and they maintained themselves until the reign of Elizabeth. In the following reign the Irish title-deeds were declared void and Scottish Presbyterians were given the land, an injustice, the fruits of which have persisted to our day. According to the last census the principal religious professions in Ulster were Roman Catholics, 690,816; Protestant Episcopalians, 366,773; Presbyterian, 421,410; Methodists, 48,816; other professions, 53,881. Linen-weaving and shipbuilding, together with agriculture and stock-raising are the chief industries. See IRELAND.

ULTIMA THULE, ŭl'tĭ-mą thū'lē. See THULE.

ULTRA VIRES, ŭl'trą vī'rēz, a law term originated in 1851 by Baron Bramwell in the case of "East Anglian Railway Company vs. Eastern Counties Railway Company" (11 Common Bench, 775). It denotes the act or contract of a corporation beyond the powers conferred upon it in its charter. It is variously applied to its authorized acts performed in an unauthorized manner; its authorized acts performed by agents of the corporation unauthorized so to act; positively illegal acts of the corporation; but most specifically to its contracts to perform acts for which it is unempowered in its charter. The general rule is that *ultra vires* contracts cannot be enforced, and any stockholder or creditor can bring restraining suits against the corporation.

ULTRAMARINE, a beautiful and permanent blue pigment originally obtained by powdering and washing the rare mineral lapis-lazuli. It is now made by heating to bright redness mixtures of aluminum silicate (china clay or kaolin), sodium carbonate, sulphur and charcoal, and washing, powdering and sifting the product. It is supposed to be a compound of silicates and polysulphides. Largely used in dyeing, calico printing, in coloring soaps and as a paint pigment. The variety known as cobalt ultramarine is prepared from a mixture of cobalt arsenate and a fresh precipitate of alumina by drying and heating slowly to a red color. Barium chromate enters into the composition of yellow ultramarine.

ULTRAMICROSCOPE. An optical apparatus designed for the collective study of particles that are too small to be individually seen by methods formerly in use. It is not, properly speaking, a new instrument, but is merely an ordinary microscope provided with certain accessory devices for illuminating the field in a special way. It is well known that the possibility of seeing small objects by means of optical magnification is limited by the fact that light has a finite (though short) wave-length. The theory of the telescope indicates that the resolving power of the instrument — that is, its ability to reveal small details — increases in direct proportion to the diameter of the object glass. Similarly in the case of the microscope, theory shows that there is a limit to the fineness of the detail that can be seen, and it is known that this limit is determined by the numerical aperture of the objective and the wave-length of the light that is used — the resolving power being greater for high apertures and for short wave-lengths. In consequence of this theoretical limitation, it follows that no microscope, however perfect, can show an object in its true form and size, unless the diameter of the object is greater than about half the wave-length of the light by which it is viewed. In the case of an exceedingly small object diffraction phenomena become very marked; and when the diameter of the object is less than the limit indicated, these phenomena become so pronounced that the objective can no longer form a definite magnified image, corresponding in shape, size or details with such configurations as the real object may possess. If the particle to be observed is stationary, it may be photographed by means of ultraviolet light; and it is possible, by this means, to obtain somewhat more detail than can be perceived by the eye, which is sensitive only to light of a longer wave-length. No great gain can be made in this way, however, because there is a limit to the shortness of the wave-length of the ultraviolet light that can be used, and the most that we can reasonably hope for, in this direction, is to increase the visibility of detail sufficiently to enable us to learn something of structures having one-half or one-third the linear dimensions that can be directly perceived by the eye while using ordinary light. By means of the ultramicroscope, however, it is possible, under favorable conditions, to perceive, by the eye, particles having linear dimensions as small, for example, as 1 per cent of the wave-length of the light that is used. The *form* of these small particles cannot be discerned, on account of the limitation imposed by diffraction and noted above. They appear like circular discs, having an apparent diameter much greater than their real diameter. Yet notwithstanding the impossibility of ascertaining the real form of these particles, it is often useful to be able to demonstrate their existence and to count their number, ascertain their average mass and study their translatory movements; and these things can be done by the aid of the ultramicroscope. The principle upon which the ultramicroscope is based is exceed-

ingly simple. We see it exemplified in everyday life when a strong beam of sunlight traverses the air of a room that is otherwise dark or dim. As is well known, the beam, when examined from the side, reveals the existence of countless motes or particles floating in the air. Everyone of these brilliantly illuminated particles acts as a secondary source of radiation and hence can be perceived by the eye. Intent examination of a beam of sunlight under these conditions will show that some of the particles present are large enough for their forms to be seen with a certain degree of definiteness by the eye. There are many others, however, that are altogether too small for this, and these smaller particles are perceived merely as luminous points, without visible form.

The principle of the sunbeam and the mote-laden air is applied in the ultramicroscope without essential modification. In the form in which the instrument is applied to the study of liquids and of such solid particles as they may hold in suspension, a narrow but powerful beam of light is sent through the liquid in a horizontal direction, while the liquid is examined from above by means of an ordinary microscope provided with a water-immersion objective — the optic axis of the microscope being at right angles to the direction of the beam of light. By the aid of an arrangement of this sort, particles that are altogether too small to be perceived under ordinary conditions may be made to stand out like tiny luminous discs against a background that is either dark or at all events far less brilliant. In liquids, the particles that are thus seen exhibit active Brownian movements (q.v.). The size of the particle that can be seen is determined by the brilliance of the illumination. If the liquid under examination contains particles of every gradation of fineness, then with any given intensity of illumination the particles that are too small to be seen in their true form, but which are nevertheless large enough to be separately revealed by means of this method of observation, appear as small luminous discs. Particles that are too small to be separately perceived in this way under the given conditions of illumination reveal themselves, collectively, by communicating a hazy appearance to the beam of light.

Lord Rayleigh had shown, in 1899, that a particle that is too small to be separately seen by the microscope under ordinary conditions may, nevertheless, become visible if it is illuminated powerfully enough, even though it may be beyond the power of the microscope to reveal its true form. Dark-background illumination, in which the object is seen by reflected, refracted, diffracted or polarized light, and not by ordinary light that is transmitted directly through it, has also been familiar to microscopists for many years, and the Wenham parabolic substage condenser, in which the central rays are cut out by means of a central stop, while the oblique peripheral rays proceed upward at such a degree of angularity that they cannot directly enter the objective, has been a familiar accessory since 1872. In ultramicroscopy the principles of darkground illumination are merely developed scientifically and pushed to their ultimate limit; and the results that are obtained by observing exceedingly small particles under such conditions are studied with corresponding care. The method was first applied to the study of colloidal solutions by Seidentopf and Zsigmondy in 1903. Consult Zsigmondy, 'Chemistry of Colloids,' translated by E. B. Spear (1917; and for special technical details consult Cotton and Mouton, 'Les ultramicroscopes et les objets ultramicroscopiques' (1906) and Zsigmondy and Bachmann, W., 'Handhabung des Immersionsultramikroscops' (in the *Kolloidzeitschrift,* Vol. XIV, 1914).

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ULTRAMONTANISM, term which originated in France to designate certain policies, teachings and tendencies favored by the Church *ultra montes,* across or beyond the Alps, and opposed to the interests of the Gallican Church: later, Ultramontanism was used to denote the whole theological system of the Church of Rome and the doctrine of papal infallibility. Previous to the Vatican Council of 1869–70 Ultramontanism was an issue within the Church. At present it is extremely difficult to define the essential character of Ultramontanism, as it has manifested itself since 1870. Many Catholics have noted that within recent years over 70 per cent of the appointees to episcopal sees have been men who have made their theological studies in Rome and were in consequence imbued with ultramontane opinions, and would carry out the papalistic system, that is, the concentration of all power in the person of the Pope. Consult article 'Ultramontanism' in 'Realencyclopädie für protestantische Theologie und Kirche' (3d ed., 1908, Vol. XX, p. 213 et seq.).

ULUGH-BEG, oo'loogh-beg (or **BEIGH),** Mongol astronomer: b. 1394; d. 1449. He was the grandson of Timûr, or Tamerlane (q.v.); governed western Turkestan as regent for his father, Shah Rokh, while the latter was employed in regulating the affairs of the southern half of the empire, and succeeded in 1447 to the imperial throne on his father's death. He built at Samarkand an observatory where he prepared tables of the sun, moon and planets, and compiled the first original star-catalogue since Ptolemy, redetermining the position of 992 fixed stars. He wrote in Arabic, from which Persian translations were later made. This catalogue was edited in England by Hyde ('Tabulæ Longitudinis et Latitudinis,' Oxford 1665, etc.), and by Baily in 1843 (Vol. XIII of the Royal Astronomical Society's 'Memoirs', London 1843).

ULYSSES, ū-lĭs'ēz (Gr. Ὀλυσσεύς, *Olysseus,* "the hater"; Lat. *Ulixes*), Greek hero. He was king of the island of Ithaca, son of Anticlea and Laertes. He sailed with 12 ships in the Greek expedition against Troy. During the Trojan War (q.v.) he was noted for his eloquence, sagacity and prudence. He was, therefore, often chosen for the services of a spy. After Achilles' death, he received that chieftain's armor, the award driving Ajax mad. But he is best known through the series of adventures and misfortunes which the enmity of Poseidon compelled him to undergo during the 10 years of his return to "far-seen rocky Ithaca." This return is the subject of Homer's 'Odyssey' (q.v.). Odysseus, according to Homer, was thrown upon the coasts of Africa, and visited the country of the Lotophagi, and of the Cy-

clopes, in Sicily. Polyphemus seized him, with his companions, six of whom he devoured (see POLYPHEMUS); but the prince, having intoxicated him and put out his one eye, escaped from the cave. Æolus, whose island he visited, gave him a bag of winds to carry him home. His companions opened the bag, the winds escaped and they were driven back to the island of Æolus. Again sailing onward he reached a land inhabited by cannibal giants, the Læstrygones, from whom he escaped with only one ship. Then he was thrown upon the island Ææa, where Circe changed his companions into swine. Subsequently he passed along the coast of the Sirens and escaped the monster Scylla (who seized some of his men, however) and the whirlpool Charybdis. In Sicily his companions killed the sacred oxen of the sun, for which Zeus destroyed his ship by lightning, and all were drowned except Ulysses, who swam to Ogygia, the island of the nymph Calypso, where for seven years he had to remain. The gods at last interfered, and Calypso suffered him to depart on a raft built by himself. Poseidon raised a storm and sunk his raft. Ulysses swam to the island of the Phæacians where King Alcinous hospitably entertained him, and sent him home in a ship to Ithaca, after an absence of 20 years. He found his palace besieged by a set of insolent suitors for the hand of his wife, Penelope. With the aid of his son, Telemachus, he put the suitors to death. A portion of his adventures forms the theme of Stephen Phillips' striking blank verse play 'Ulysses' (1902); and Tennyson's noble 'Ulysses' is also concerned with the life of the Greek hero. Consult Lübker, Friedrich, 'Reallexikon des klassischen Altertums' (8th ed., Leipzig 1914).

UMA, oo'mă, in Hindu mythology, the consort of the god Siva. She is also usually designated under the names of Kâli, Durgâ, Devi (q.v.), Pârvati, Bhavâni, etc. This goddess is worshipped in various parts of India; but the textbook of her worshippers is the "Devimahatmya," or "the majesty of Devi"—a portion of the "Markandeya Purana," in which are detailed the martial feats of the goddess. These consisted chiefly in the destruction by her of two demons, Madhu and Kaitabha, who had endangered the existence of the god Brahman, in her victory over the demon Mahisha, or Mahishasura, who, having conquered all the gods, had expelled them from heaven; and the defeat of the army of Chanda and Munda. She is often represented holding the severed head of Chanda in her hand, with the heads of his soldiers formed into a wreath about her neck, and their hands spread into a covering for her loins. The worship of Kali (the Black), to which the narrative (of her victory over Chanda and Munda) has given rise, is considered by the Hindus themselves as embodying the principle of "tamas," or darkness. She is represented as delighting in the slaughter of her foes, though capable of kindlier feeling to her friends. She is, however, styled the Black Goddess of Terror, frequenting cemeteries, and presiding over terrible rites, fond of bloody sacrifices; and her worship taking place in the darkest night of the month. Her chief worship is in Bengal where her animal feast is one of the great religious and social events of the year. Max Müller (1823–1900) develops the myth of Uma into one of those solar myths suggested to the primitive mind by the most familiar of astronomical phenomena. Consult Barnett, L. D., 'Antiquities of India' (1913); Muir, John, 'Original Sanscrit Texts' (London 1873); Wilkins, W. J., 'Hindu Mythology' (London 1900).

UMATILLA, a North American Indian tribe of Shahaptian stock, who dwelt formerly near the confluence of the Columbia and the river which bears their name. They did not practise agriculture but found a means of subsistence in game, fish, fruit, etc. In 1804 they were visited by Lewis and Clark and in 1845 by Jesuit missionaries by whom they were converted to Christianity. Under a treaty of 1855 they were, with the Cayuse and Walla Walla, placed on a reservation near their old home. At present they number about 300.

UMATILLA RIVER, Ore., a southern affluent of the Columbia River, rising in the Blue Mountains, and after a west and northwesterly course of about 150 miles through Umatilla County uniting with the Columbia at Umatilla village on the boundary between Oregon and Washington. Pendleton, the capital of Umatilla County, is the chief town along its course.

UMBAGOG, ŭm-bă'gŏg, a lake, the greater part in New Hampshire, in Coos County, and part in Oxford County, Me. It is about nine miles long and from one to one and one-half miles wide. Its outlet is a short stream which enters Richardson Lake, in Maine. The scenery around Umbagog is most beautiful, and its waters are well stocked with trout and other fish. It is a favorite resort for sportsmen.

UMBALLA, ŭm-băl'a, or **AMBÁLA**, India. See AMBALA.

UMBELIFERS, or **APIACEÆ**, a family of herbs and a few shrubs popularly known as the parsley family. The species, of which about 1,500 have been described and grouped in approximately 200 genera, are most abundant in the north temperate and Arctic zones. Many species are also characteristic of high altitudes in more equatorial latitudes. The most notable feature of the family is the arrangement of the flowers in umbels, which characterize nearly all the species. The umbels are often compounded, that is, they are composed of smaller umbels called umbellets. The leaves are sometimes simple but generally compound, and usually contain resinous substances (volatile oils) which are characteristic of the individual species and either give or assist in giving the plants their acrid or pleasant flavors. In some species these flavors are very disagreeable, as, for instance, in asafœtida; in others pleasantly odorous, as in fennel and anise. These last two species and several others, such as parsley, caraway, coriander and celery (qq.v.) are popularly used for flavoring culinary preparations, such as salads, soups, sauces and dressings. The stems of celery have been greatly enlarged by cultivation, and are among the most esteemed salads, both in America and Europe. Several umbellifers have become important root crops in temperate climates. Of these the parsnip and the carrot are the best known in America, but several others are cultivated in Europe, Asia and southern Africa. Some of these, such as skirret

(*Sium sisarum*), and chervil (*Chærophyllum bulbosum*), are occasionally cultivated in American gardens. Many of the species, including those now cultivated as esculents, were formerly considered to have medicinal properties, but except in a few cases, such as fennel and anise, they have been discarded and in these cases they are now used merely to disguise the unpleasant flavors of other drugs. Formerly, also, many were reputed harmful and even poisonous when eaten by man and animals. Among these was the parsnip. The ill repute has been completely dispelled in most cases, but still clings to celery and parsnip; the former being reputed poisonous to certain individuals; the latter at certain seasons. Some of the uncultivated species are still under ban in some sections of the country but not in others. Besides the genera mentioned, the following are among the most important: *Crithmum, Archangelica, Conopodium, Smyrnium, Levisticum, Eryngium* and *Prangos*. Botanically the family has been found difficult to arrange satisfactorily. Coulter and Rose have described the American species; De Candolle, Koch, Sprengel, Engler and other Europeans have also devoted much attention to this large group.

UMBER, an olive-brown earthy pigment that becomes redder when heated. This earth is found in several localities; the best variety has come for some time past from Cyprus and goes by the name of Turkish umber. It is found also in Georgia, Illinois, New York and Pennsylvania. Raw umber is of an olive-brown color, semi-opaque, perfectly durable in water or oil, and does not injure any other good pigment with which it may be mixed. It is essentially a mixture of oxides of iron and manganese with 13 to 14 per cent of silica, together with small amounts of lime, magnesia, alumina, water, etc. When highly heated all the water is drawn off, causing a change in the brown hydrated ferric oxide to red ferric oxide, and also increasing the percentage of red-brown manganese oxide. The pigment is now called burnt umber. Raw umber is not subject to adulteration, but a ferruginous peat or brown coal from near Cologne is sometimes substituted for it. See PAINT.

UMBILICAL CORD, the bond of communication between the fœtus (which enters at the umbilicus, or navel) and the placenta, which is attached to the inner surface of the maternal womb. It consists of the umbilical vein, lying in the centre of the two umbilical arteries winding from left to right round the vein. Contrary to the usual course, the veins convey arterial blood to the fœtus, and the arteries return venous blood to the placenta. As soon as a child is born, and its respiration fairly established, the umbilical cord is tied, and divided near the navel, which spontaneously closes, the fragment of cord dying away. See FŒTUS; OBSTETRICS; PLACENTA.

UMBRA, the Latin word meaning shadow, was for the ancient Romans a person who attended a feast uninvited by the host but as companion of one that was invited, whom he followed as his shadow; this parasite's duty was to laugh at the jokes of his patron. *In astronomy*, the black central portion of a sun-spot was first called umbra by Dawes; he limited the designation nucleus to the patch of deeper blackness sometimes noticed in the umbra, though the whole of the darker area is often called nucleus: The fringe of lighter shade surrounding a sun-spot is called penumbra. *In ichthyology*, the solitary genus *Umbridæ* comprises two species: *U. krameri*, a small fish three or four inches long, found in stagnant pools in Austria and Hungary; and *U. limi*, rather smaller, locally distributed in the United States; its common name is dog-fish or mud-fish.

UMBRELLA, as its name implies, an instrument for casting shade. They were introduced from Asiatic countries, where they are of great antiquity, and are used as protectors from the sun's rays, rather than from rain. They were brought to England from Italy in the early part of the 18th century, and later came into general use, being employed by ladies, but scorned by men as effeminate, until Jonas Hanway, an eccentric traveler, demonstrated its utility as a protection from rain. They soon came into universal use. The general construction of umbrellas has changed little in the thousands of years it has been known, the ancient Chinese patterns being adopted by the Europeans. Gloria or alpaca in the common grades and silk in the finer ones have been substituted for the oiled paper once used for the covering, while grooved steel ribs have taken the place of the bamboo, rattan or oak ones. English manufactories control the largest output of the article and maintain a general excellence of quality. In Burma and Siam the umbrella is an emblem of rank. The Japanese have used umbrellas ever since their empire was established. In Greece they were used by ladies of position, and the Greek poets have reference thereto. In Rome women and effeminate men used them as a protection from the sun's heat.

UMBRELLA-BIRD, an extraordinary South American forest-bird (*Cephalopterus ornatus*) of the family *Cotingidæ*, which takes its name from its remarkable crest of feathers, the shafts of which, according to Wallace, radiate on all sides, reaching beyond the tip of the bill and forming a dome or parasol about four inches in diameter. The resemblance of this ornament to a helmet-plume has led to the name "dragoon-bird." Another curious feature is a cylindrical fleshy process, an inch and a half long, pendent from the front of the neck, and clothed with overlapping feathers. This bird is about the size of a crow and glossy black with a blue gloss on the crest. It inhabits the valley of the Amazon. In the Andine region occurs a second species (*C. penduliger*) with a much longer dewlap; and in Central America a third (*C. glabricolis*) in which the throat and dewlap are naked, except at the tip of the latter, and colored orange-red. These birds feed on berries and fruits, and have a loud, clear song. Consult Wallace, A. R., 'Travels on the Amazon' (London 1853); Newton, 'Dictionary of Birds' (New York 1896).

UMBRELLA-TREE, in eastern America, the larger species of *Magnolia*, and especially *M. tripetala*, or elk-wood. The latter's great, thin, oval leaves are pubescent beneath, nearly two feet long, and half as wide, and radiate from the ends of the branches, in a manner suggestive of the protecting ribs of an umbrella. It is a tree from 30 to 40 feet tall, with

irregular branches, and grows naturally in shady woods and in deep soil. The flowers are large and cup-shaped, with creamy tinted, thick petals, and reflexed petaloid sepals, and have a disagreeable odor. The tree, nevertheless, is sometimes planted for ornament, being completely hardy no farther north than Pennsylvania. The bark is slightly aromatic and tonic, but the wood is valueless. The ear-leafed umbrella-tree is *M. fraseri*, with auricled foliage and fragrant flowers. *M. macrophylla* is the great-leaved umbrella-tree. The pride-of-China-tree (*Melia azedarach*) has produced in the southwestern United States a variety, *umbraculifera*, which forms a regular, dome-shaped head like an open sun-shade, and is consequently to be added to the list of umbrella-trees. The Queensland umbrella-tree is the handsome araliaceous *Brassaia actinophylla*, a tree 40 feet high; that of Guinea is *Hibiscus guineensis*. A screwpine, *Pandanus odoratissimus*, is also known by this name.

The umbrella-pine, or parasol-fir, is a tall evergreen tree (*Sciadopitys verticillata*) from Japan, with a pyramidal habit. Its true leaves are reduced to minute scales, and its apparent glossy, dark foliage is composed of phyllodia, or stems assuming the functions of leaves, which are arranged in umbrella-like whorls on the branches.

UMBRIA, Italy, one of the ancient divisions of the peninsula, lying west of Etruria, and north of the country of the Sabines, and corresponding approximately to the modern district of the same name, in the province of Perugia. It is usually described as extending from the Tiber east to the Adriatic; but when the Umbrians first came into history they were restricted to the ridge of the Apennines, the lowland region bordering on the Adriatic from the Æsis (Esino) to the Rubicon being held by a race of Gallic invaders, known as the Senones. The Umbrians were subjugated along with the Etruscans, but joined the Samnites in their last gallant struggle against Rome, and were finally overthrown at Sentinum (295 B.C.). Later the Via Flaminia was constructed through Umbria and in the Augustan period Umbria was the sixth region of Italy. (See ITALIC LANGUAGES). The modern district formed part of the states of the Church until 1860. Its area is 3,748 square miles and a population of 686,500. The capital is Perugia, of which Leo XIII (then Mgr. Pecci) was archbishop for 32 years prior to 1878.

UMLAUT, oom'lowt, in philology, a modification of vowels; the change of the vowel in one syllable through the influence of an *a*, an *i* or a *u* in the syllable immediately following. It is common in Teutonic languages — German, Scandinavian and Anglo-Saxon; traces of it remain in English, as in the plurals of man (men), brother (brethren), mouse (mice), goose (geese), etc. In German the umlaut is seen in the frequent change of *a*, *o* and *u* to *ä*, *ö*, *ü*, as *Mann, Männer*; *Sohn, Söhne*; *Kraut, Kräuter*. Consult Henry, Victor, 'Short Comparative Grammar of English and German' (London 1894), and Lichtenberger, H., 'Histoire de la langue allemande' (Paris 1895).

UMNAK, oom'näk, an island of Alaska, one of the Fox Islands, a group of the Aleutian Islands. It is about 66 miles long and 10 miles wide. On the east is Umnak Pass, five miles wide, which separates the island from Unalaska Island. The interior was explored, in 1757, by Nikiforoff, a Russian. The island is of volcanic origin; the highest point, Vsevidoff, is a volcano 8,000 feet high. Other peaks are also volcanoes. Just north, and connected with Umnak by a reef, is the volcanic island of Bogosloff which was thrown above water in 1796. On Umnak are many hot springs; in one part the springs are boiling. Near Deep Bay there are springs which vary in temperature. Fossil-wood, lignite, fire-clay and different forms of lava are found on this island. The largest village, Nikolski, has about 300 inhabitants. The chief industries are catching seal and fishing.

UMPQUA, ŭmp'kwâ, a small tribe of the Athapascan stock of North American Indians. They now number about 100 individuals and are on the Grande Ronde reservation in Oregon.

UMRITSIR, ŭm-rĭt'sẽr. See AMRITSIR.

UN CURIOSO ACCIDENTE ('A Curious Mishap'), a three-act prose comedy in Italian by Carlo Goldoni, first produced, as the author's 'Memoirs' apparently indicate, in Venice in 1755 and generally regarded as his masterpiece. Nevertheless, the prestige given both in this country and elsewhere by Eleonora Duse to the author's 'Locandiera' ('The Innkeeper') has made the latter play better known to the theatre-going public than the former. Of the plays written by Goldoni in Italian 'Un curioso accidente' is certainly one of his best and one of the gems of standard Italian comedy. The simplicity of the plot is remarkable, consisting in the amusing misguided effort of a wealthy Dutch merchant to marry off secretly the daughter of one of his friends and, in the attempt, marrying off unwittingly his own daughter. Goldoni says in his 'Memoirs' (Part II, cap. 30) that the story of the plot is true, "that the curious mishap happened to a wealthy Dutch merchant, and was related to him by two of the merchant's Venetian agents." He goes on to add that "the piece had an entire success . . . and is still one of my favorite pieces." In another part of the 'Memoirs' (Part III, cap. 37) Goldoni relates that the play was translated into French by a Frenchman in 1784 with the title 'The Dupe of Himself,' that it was played the following year and proved a complete failure. The merit of the play lies in its extreme simplicity, in the sprightliness of the dialogue, few of the speeches containing more than three or four words or a line or two, in the amusing situations in Goldoni's best vein and in the artistic perfection of the construction of the comedy. Some of the scenes, for instance Act II, 8, are worthy of Molière. For American students of Italian, the edition of the play edited with English notes by Professor Ford of Harvard University is very useful and most readily available (Boston 1899). An English translation was published by the A. C. McClure Company in 1892 in the series 'Masterpieces of Foreign Authors.' This version was produced by Mr. Donald Robertson in 1907–08. 'Un curioso accidente' was performed in Italian under the auspices of the Modern

Language Department of the University of Toronto in 1917.

JAMES GEDDES, JR.

UNA, ū'nạ, in Spenser's 'Faerie Queene,' the allegorical representative of Truth, which in this "lovely ladie" shines forth in all its purity. By her gentle spirit she tames a lion (Reason), which accompanies her through her distressful wanderings. For her sake her companion, George, the Red Cross Knight, slays the dragon, and after a period of painful separation they are united in marriage.

UNADILLA, ū-nạ-dĭl'ạ, N. Y., village in Otsego County, on the Susquehanna River, and on the Delaware and Hudson Railroad, about 45 miles northeast of Binghamton and 93 miles southwest of Albany. It is in an agricultural region. The chief manufacturing establishments are a flour mill, creameries, machine shop, foundry and a wagon shop. The educational institutions are Union School and Academy, ranked as a high school, opened in 1893, and elementary and primary schools. There is one bank. Pop. 1,009.

UNAKA MOUNTAINS, a southwestern division of the Appalachian system, sometimes called in part the Great Smoky Mountains or simply the Smoky Mountains. They extend southward near the western boundary of North Carolina and Tennessee. The elevation of the range varies from 3,000 to 5,000 feet. They are well covered with pine trees and the slopes present a very picturesque aspect. Sandstone and shales with some metamorphic rocks make up the bulk of the range.

UNAKITE. A peculiar granite consisting essentially of yellow-green epidote, pink feldspar and quartz; occurs in Unaka Mountains, along North Carolina, Tennessee line and in Virginia. Used for ornamental work.

UNALASKA, oo-nā-lās'kạ, an island of Alaska, one of the Aleutian Islands, and the middle one of the Fox Islands. Two Russians, Glottoff and Soloiroff, with a small party of adventurers, lived several months on the island the winter of 1765–66. The island is often visited by whalers, sealers and explorers. It was an administrative centre, and is still one of the important parts of Alaska. A naval rendezvous is at Captain's Bay, at the northeastern end of the island. The island is volcanic; the highest point, Makushin, 5,960 feet, smokes constantly and occasionally it sends out lava. The vicinity is often subject to earthquakes. At Iliuliuk the thermometer is rarely above 80 degrees in summer or below zero in winter. The climate is too cool for much vegetation. Copper and iron abound. But few small animals are found. The largest town, Unalaska, on Captain's Bay, is an outfitting station for ships passing to and fro from the Pacific to the Arctic oceans. The area of the island is about 800 square miles. Unalaska has a population of about 1,200, Aleuts, Russians and Americans.

UNAMI ("people down the river"), a division of the Delaware Indians of Pennsylvania, who occupied the Delaware River from the mouth of the Lehigh to the Delaware boundary line. They were sometimes referred to as the Turtle tribe, in allusion to one of their totems.

UNAU, the two-toed sloth. See SLOTH.

UNCANOONUC MOUNTAINS. A small range of mountains in southeastern New Hampshire, rising rather prominently above the adjoining rolling lands to an altitude of 1,348 feet. Somewhat well known as a summer resort. They are reached by trolley line from Shirley and Manchester. Used as a station in a base line of the United States Coast and Geodetic Survey. They consist of granite and gneiss.

UNCARIA, a genus of climbing plants with hooked spines, of the order *Chinconiacæ,* and natives of the East Indies and tropical America. See GAMBIR.

UNCAS, ŭng'kas, Mohegan sachem: d. about 1683. He was originally a war chief of the Pequot sachem Sassacus, obtained the support of the English settlers and so acquired dominion over the Mohegan territory. In 1637 he joined the English in the war against the Pequots and received for his services another portion of the Pequot lands. He shielded many of the Pequots from the vengeance of the English when the war was over, and for this was for a time in partial disgrace with the authorities; but he was soon received again into so great favor with the whites that several attempts were made by different Indians to assassinate him. In 1643 he was victorious over the powerful Narragansett sachem Miantonomoh (q.v.) and in 1648 the Mohawks, Pocomtocks and other tribes unsuccessfully made war against him. He was besieged in 1657 by the Narragansett chief Pessacus, and is said to have been relieved by Ensign Thomas Leffingwell. In reward for this service it is said Uncas gave to Leffingwell all the land now included in the site of Norwich, Conn. In 1654 Uncas was reproved for "rapacity and injustice" by a council of colonial commissioners. He was the ally of the English in all the wars against the Indians during his life, though in King Philip's War he was too old to be of much active service. In 1842 a monument was erected in his honor at Norwich. Consult Drake, S. G., 'The Book of the Indians of North America' (1834); Stone, W. L., 'Uncas and Miantonomoh, a Historical Discourse' (1842). See COLONIAL WARS IN AMERICA.

UNCIAL LETTERS. See PALÆOGRAPHY.

UNCLE REMUS, a plantation negro, the assumed narrator of plantation and folklore stories collected by Joel Chandler Harris in such books as 'Uncle Remus: His Songs and His Sayings' (1880); 'Nights with Uncle Remus' (1882); 'Uncle Remus and His Friends' (1892), etc.

UNCLE SAM. See NATIONAL NICKNAMES.

UNCLE TOM'S CABIN, or **LIFE AMONG THE LOWLY,** a novel by Harriet Beecher Stowe (q.v.), the most important contribution of the emancipation movement to American literature, first appeared as a serial from 1 June 1851 to April 1852 in the *National Era,* an anti-slavery newspaper published at Washington, D. C. In serial form it attracted no particular attention, but after publication in book form, 20 March 1852, in a few weeks it achieved unusual success, finally attaining world-wide popularity, and being translated into over 22 different languages. For 18 years Mrs. Stowe lived in Cincinnati, where the problems of slavery were continually thrust upon her

attention, the river Ohio alone separating the city from Kentucky, where slaves bringing their tales of oppression and cruelty were continuously escaping from their masters in attempts to gain freedom in Canada. In the great moral, economic and political movements of the times Mrs. Stowe and her husband took an active part. They had removed to Brunswick, Me., where Mr. Stowe had been appointed professor in Bowdoin College, when the storm occasioned by the Fugitive Slave Bill arose. Inspired by the force of the human message which she felt she must deliver, with full-stored memory and vivid imagination, she wrote with fervor-glowing heat the novel as representative of certain phases of plantation life in the old South, which helped in no small measure the cause of emancipation. Few novels have ever aroused so much enthusiasm and indignation, so much criticism, favorable and unfavorable. 'A Key to Uncle Tom's Cabin,' including interesting notes, documents and testimonials appeared in 1853 as a reply to inquiries, censure and criticism, and the same year she also published 'A Peep into Uncle Tom's Cabin for Children.' Josiah Henson (q.v.) was the original of the character of Uncle Tom. Dramatized soon after its publication in book form, 'Uncle Tom's Cabin' still retains its stage popularity.

UNCLEANNESS, a ceremonial in various religious systems, symbolizing the lack of ritual purity of fitness. In the Brahmanic system food cooked by a Sudra or by an outcast is unclean to the Brahman; he loses caste if he eats of it; and he contracts ceremonial uncleanness if he consorts with unclean persons, as the Pariah, the Mahar or other outcasts. The hieratic law of Judaism pronounced certain animals unclean and, therefore, not to be eaten. Of animals that "chew the cud" all might be eaten, with exception of four; but of the four excepted — the camel, coney, hare and swine — the first only is of the class of the ruminants. Among birds declared to be unclean are the eagle, ossifrage, vulture, kite, etc., of which several cannot be positively identified; but at all events the birds of prey are certainly included among the unclean birds, while most of the grain-feeding birds are allowed as articles of food. Among fishes or aquatic creatures, those are unclean which have neither fins nor scales. Except the leaping orthoptera — locust, grasshopper, etc.— most insects are unclean, as also all creeping things, from vertebrate reptiles to molluscous snails. And not merely were unclean animals to be rejected as food, their carcasses were to be avoided, and whoever touched them became thereby unclean. The laws of ceremonial uncleanness were never of obligation in the religion of Jesus Christ, who taught that "not that which entereth into the mouth defileth the man; but that which proceedeth out of the mouth, this defileth the man"; and with regard to persons, Saint Peter, after the vision of the sheet let down, would no longer call any man common or unclean. Consult Benzinger, I., 'Hebräische Archäologie' (2d ed., Tübingen 1907), and Stade, B., 'Geschichte des Volkes Israel' (Vol. I, Berlin 1887).

UNCOMPAHGRE VALLEY PROJECT. The Uncompahgre Valley Project is one of the largest construction enterprises undertaken by the United States Reclamation Service under the Act of 17 June 1902. It effected the irrigation of 150,000 acres of arid lands lying on both sides of the Uncompahgre River in southwestern Colorado. It was accomplished by the diversion of the waters of the Gunnison River into the Uncompahgre Valley and the subsequent distribution of the water thus diverted, together with the waters of the Uncompahgre River, over the lands to be cultivated.

The engineering works connected with this project are as follows:

(1) The Gunnison Tunnel, which pierces the divide which separates the Gunnison River from the Uncompahgre River. This tunnel is 30,582 feet long and passes under the summit of the divide at a depth of 2,220 feet. The eastern portal of the tunnel lies in the grand canyon of the Gunnison River. It is reached by a wagon road 10 miles in length, which is one of the picturesque drives of Colorado. The western portal is located in the Uncompahgre Valley near Cedar Creek Station on the Denver and Rio Grande Railway.

(2) The South Canal, which carries the water from the Gunnison Tunnel to the Uncompahgre River; 12 miles in length. This canal contains four short tunnels and many masonry drops.

(3) The West Canal, which distributes the waters from the Gunnison Tunnel and the Uncompahgre River over the lands west of the Uncompahgre River; 30 miles in length.

(4) The East Canal, which distributes the waters from the Gunnison Tunnel and the Uncompahgre River over the lands lying east of the Uncompahgre River; 35 miles in length.

(5) Numerous auxiliary canals and laterals.

(6) Impounding reservoirs on the headwaters of the Gunnison River for the storage of flood water to supplement the regular flow of the stream during the dry months. Streams of the arid region derive their summer flow in the main from melting snows in the high mountain ranges. When the warm sun of the spring months begins to be felt the great body of snow on mountains and foothills disappears quickly in floods of more or less magnitude, depending upon prevailing seasonal conditions. During the summer months the flow depends upon the slowly-melting snow fields which lie in deep gulches and behind lofty precipices, where they are sheltered from sun and wind. This late flow is inadequate to the requirements, and to supplement it convenient basins are dammed and filled with flood waters to be released gradually when needed later in the year. To provide for this contingency sufficient reservoir sites have been segregated on the headwaters of the Gunnison River. These sites will be held and developed as future needs dictate. In addition to supplementing the irrigation waters these reservoirs will be useful as power producers.

The Uncompahgre Valley lies at about 5,000 feet above sea-level. It is sheltered by lofty mountain ranges and enjoys a mild and equable climate. The mountains surrounding the valley form a portion of the continental divide, and contain many of the richest gold, silver, copper and rare metal mines in the world. The soil of the valley is of unusual fertility. The principal products are apples, peaches, apricots,

prunes, cherries, wheat, oats, potatoes, sugar beets and livestock.

UNCONFORMITY, an erosional break in the continuity of deposition of sediments. When one stratum is deposited on the next in regular and unbroken order they are conformable. But when the surface of one bed is eroded before the next is laid down the two are said to be unconformable. If the beds are marine, that is, have been laid down in the ocean, an unconformity between them means that there was a period of emergence and erosion between the time of deposition of the first and second beds. It is by this means that we are enabled to work out much that is known about the distribution of land and water in past geologic time. Sometimes the older beds are folded as well as eroded, so that the younger lie horizontally above dipping beds below. This is called angular unconformity or discordance of bedding. If a region gradually sinks so that a series of beds are laid down above an old erosion surface in such wise that each succeeding bed covers a larger area and laps over from the bed on which it naturally rests onto the old erosion surface, we have unconformity with overlap.

UNCONSCIOUS CEREBRATION, term formerly in general use in mental physiology, to denote the action by the mental faculties (or the cerebral organs), as of memory, reasoning, etc., performed without the mind being conscious of what it does till the results of this unconscious action present themselves in the centres for consciousness in the new ideas or new combinations of ideas which were evolved in the unconscious process. The theory of unconscious cerebration has been current among German metaphysicians from the time of Leibnitz and was systematically expounded by Sir William Hamilton. See CONSCIOUSNESS.

UNCONSCIOUSNESS, a condition of little or no consciousness. The definition of consciousness (q.v.) has been given in another volume and it remains here to consider those degrees and kinds of deviations from ordinary conscious states, particularly in the subnormal depressions. Under unconsciousness may be grouped two or three types. There may be total abeyance, such as is seen in epilepsy, in sleep, in brain concussion, in severe injuries, in infectious diseases, in drugs, as anæsthetics, hypnotics, alcohols, etc. There may be subnormal conditions, semi-conscious, subconscious states which would properly be classed here, for in certain conditions, such as in some epileptics, some alcoholics or hysterics, consciousness at one time may be acute and yet all memory of the former state may be obliterated in another condition. Some of these conditions are grouped under the heading of double personalities. Some of these represent true phenomena, the vast majority are frauds. Thus from the minor forms of "absent-mindedness" through sleep, up to the deepest grades of unconsciousness produced by drugs, one can observe in life all the many steps of a large variety of unconscious phenomena. The site of consciousness has already been discussed and its coexistence with the entire nervous system maintained, but clinically it appears under many exciting causes. The most important of these are:

Unconsciousness due to

1. Convulsions of unknown origin.
2. Epilepsy.
3. Hysteria.
4. Organic brain diseases.
5. Organic heart diseases.
6. Toxic causes — poisonings, endogenous and exogenous.
7. Traumatism.

(1) In childhood convulsions with unconsciousness come on from a large number of unknown causes. Fear, anger, high temperature, teething, worms, are some of the actual irritants in many of these instances; but in many no cause, immediate or remote, is to be found. Many of these attacks resemble attacks of epilepsy. They are to be carefully watched to determine this point, otherwise much harm may come, particularly if they are mild epileptic attacks and the epileptic habit be engendered by carelessness in treatment. Sometimes these convulsions leave permanent brain injuries, but the majority recover without serious after effects. Convulsions in a child of unknown origin should mean to the mother that the nervous system is very readily upset and special precaution should be taken to avoid all forms of excitement in such children.

(2) Epilepsy. The most common form of unconsciousness in epilepsy has already been discussed (see EPILEPSY), but there are in some epileptics minor alterations of consciousness that are of much importance. In some epileptics the patient, while not truly unconscious, yet may be so engrossed in a dominating idea that all outside elements of attention are excluded. Thus some of this class may rob, murder, burn, roam off for days or even weeks, and yet on their return to their so-called normal conscious state, they may be absolutely oblivious to all that has happened. Such states are not uncommon in epileptics, but they are very rare outside of this condition and hysteria.

(3) Hysteria (q.v.). In this disease unconsciousness is rarely complete. Consciousness is altered. These changes are fully discussed. Also see INSANITY; PARANOIA.

(4) Organic Brain Disease. A number of brain diseases may cause unconsciousness. The most common are meningitis, hemorrhage, thrombosis, embolism, tumors, organic dementias. Under the general term apoplexy is included three separate disorders, all of which have similar symptoms. These are hemorrhage, embolism, thrombosis. In the one, a blood vessel in the brain breaks and there is destruction of brain tissue, in the second, a clot, usually from a larger blood vessel, is swept into a smaller blood vessel of the brain, cutting off the blood supply of a part of the brain. In a third a disease of the wall of the blood vessel causes a local clot which fills up the vessel and in the same manner deprives a part of the brain of blood. In all of these conditions a "stroke," or apoplexy, with unconsciousness occurs. The individual symptoms may be consulted under apoplexy, hemorrhage of brain, embolism, etc. In general paralysis of the insane, attacks of unconsciousness are a regular part of the development of the disease. See GENERAL PARESIS.

(5) Some forms of heart disease are attended with fainting attacks. In these the

valves of the heart are found to act in a defective manner. See HEART, DISEASE OF THE.

(6) For a consideration of the toxic causes of unconsciousness see article on TOXICOLOGY.

(7) Traumatism, such as blows on the head, severe falls, sunstroke, all give rise to unconsciousness. The two former conditions have been discussed under concussion — the last under sunstroke. See CONSCIOUSNESS; CONSCIOUSNESS, DISORDERS OF; CONSCIOUSNESS, BIOLOGICAL ASPECTS OF, and consult bibliography under the first of these.

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UNCTION, anointing with oil as a religious or semi-religious rite, is traceable back to the rudest form of nature worship. The pillars of stone or of wood that were the symbols of phallic worship, as the sacred stone in every village of certain parts of India at present, had oil poured on the top of them. The custom of pouring oil on sacred stones was not unknown to the Israelitish race (Gen. xxviii, 18; xxxi, 13). In the Mosaic ceremonial the use of unction is expressly prescribed for various occasions; among the Jews there was a holy anointing oil prepared with perfumes (Ex. xxx, 22–23) with which the priests and the tabernacle with all its furniture were anointed; the kings also were installed in their office by unction; and the usage was retained in the Christian Church, being employed in the administration of the sacraments of baptism, confirmation, order, in the consecration of altars, of sacred utensils, etc., and in the coronation of sovereigns. See UNCTION, EXTREME.

UNCTION, Extreme ("the last anointing"), one of the sacraments of the Roman Catholic Church as also of the Greek Orthodox Church; it is a sacrament in which the sick that are in danger of death are anointed by a priest for the health of soul and body; its divine origin and sacramental character are inferred from the passage James v, 14, 15. The "matter" of this sacrament is "oil blessed by the bishop"; but in the Greek Church the priests, commissioned by the bishop, bless the oil. The "minister" of extreme unction is a priest, not any cleric in inferior orders. The "subject" of the sacrament is a person that is dangerously sick. The "form" consists in the prayers pronounced by the priest in administering the unction; for example, at the unction of the eyes, the priest prays, "By this holy unction and through his most tender mercy, may the Lord forgive thee whatsoever sin thou hast committed by sight."

UNDER-TENANT. See RENT, LAW OF.

UNDERGROUND MINING. See MINING.

UNDERGROUND RAILROAD, The, a term made common in the United States prior to the Civil War, denoting a secret method of conducting negro slaves from the Southern States to Canada and free States in the North. Between the Ohio River and the Great Lakes were many abolitionists who gave shelter and assistance to escaping slaves, and their homes were known as stations of the underground railroad. Among those who were patrons of the "underground" system were Wm. Lloyd Garrison, Wendell Phillips, Josiah Grinnell, Gerrit Smith, Theodore Parker, Thomas Garrett, Charles Torrey, Samuel May, Levi Coffin, T. W. Higginson and F. B. Sanborn. (See ABOLITIONISTS). Consult Siebert, W. H., 'The Underground Railroad from Slavery to Freedom' (New York 1899).

UNDERGROUND RAILWAYS. See SUBWAYS; TUNNELS AND TUNNELING.

UNDERGROUND RUSSIA, a noted work by Stepniak. The former editor of *Zemlia i Volia* (Land and Liberty), who for many years hid his identity under the pseudonym of "Stepniak" (freely translated "Son of the Steppe"), wrote in Italian, in 1881, this series of sketches of the revolutionary and Nihilistic movement in which he had taken such an important part. The introduction gives a succinct history of the individualistic propaganda which resulted in Russia in a certain measure of freedom for women, and which, at the expense of much suffering and many young lives sacrificed, spread a leaven of liberalism through the vast empire of the tsars. Stepniak traces the successive changes that took place in the attack on autocracy between 1871 and 1881. The movement reached its final goal in 1917, when tsarism went down under a crushing defeat.

UNDERGROUND TEMPERATURES. In the process of cooling the earth still retains a vast volume of heat. This heat is not appreciable at the surface where air temperatures prevail but it is manifest in deep mines and borings which show a general increase of temperature with depth. The rate of increase is by no means regular but varies from place to place and in some cases it changes with depth. In general it ranges from 40 to 80 feet to 1° F. and the average indicates that at a depth of 25 miles the temperature is about 2,200° F. or above the melting point of iron and rocks. It is difficult to conceive how great the maximum may be farther down. This heat is believed to be a residual of that which was present when the earth was in molten and gaseous conditions. Much has been lost by the cooling-off process that is still in operation. Volcanoes may be evidence of the general internal heat although it is more likely that they are manifestations of some local heat conditions probably developed at moderate depths.

A large number of observations have been made of underground temperatures in deep mines, wells, bore holes and tunnels in various parts of the world. Many of these have been taken with great accuracy and others are approximations. Some representative ones are given at the end of this article.

Rates of increase of earth temperature are calculated from the difference between the mean annual air temperature and the observed temperature at the given depth, it being assumed that the temperature for the first 50 feet below the surface is that of the mean annual air temperature. It has been found, however, that the latter figure is somewhat too low, the discrepancy varying with latitude and various local conditions. The difference is about 1½° in a humid climate like that of England and 2½° to 3¼° in a dry climate such as that of northern Africa. In some cases the temperature at some shallow depth is directly determined and used for the comparison. In many instances temperatures are taken of various depths and the results plotted in a curve which is independent of the

surface temperature. Many temperatures have been obtained of flows from deep artesian wells and also of flows from pumped wells. In these it is necessary to know the depth of the source of the water and the flow must be large in volume and long continued. The thermometers used are of several kinds but ordinarily self-registering maximum mercury thermometers or thermo-electric instruments are lowered in the borings or sunk in holes in deep mines. In deep holes, convection, gas expansion and heat from recent boring vitiate the result. The influx of deeper waters, proximity of recent volcanic rocks, lodes in which mineralization is in progress and planes or zones of movement have great influence, the last especially in facilitating rise of deep seated underground water. In mines, especially coal mines, oxidation materially increases the heat. In the upper part of the Anzin coal mines, in France, the temperature is 15° F. above the normal.

One of the most striking features of the rates of underground temperature increases as observed in borings and mines is their variation from place to place. Undoubtedly some of these variations are due to imperfect observations but most of them are related to local causes of which the nature is not known. Attempts have been made to show that rates are lower in the mountains, higher in petroleum areas and coal fields and various other general conditions but in most cases these relations are not borne out when many observations are assembled. There are undoubtedly in the earth many factors which influence the rate of temperature increase such as variation in conductivity of various rocks, underground tension, mineralization and movement of underground water. Local volcanic action of course is a most powerful agent but only present in certain areas where its influence generally is clearly apparent. Variation in radioactivity has been suggested as a factor, and the influence of bodies of cold water such as Lake Superior and former presence of glacial ice as causes of local diminution of earth temperature. Positive evidence is lacking along all these lines, however, and the results of extended special investigations must be awaited before the true explanation is attained.

Selected Observations in Europe, Etc.

	Depth, feet	Gradient feet to 1° F.
GREAT BRITAIN		
Bootle waterworks (Liverpool)	1,302	130
Talargoch lead mine (Flint)	1,041	80
Nook Pit, colliery, East Manchester coalfield	1,050	79
Bredbury " " "	1,020	78½
Ashton Moss " " "	2,790	77
Denton " " "	1,317	77
Astley Pit, Dukinfield	2,700	72
Scarle boring (Lincoln)	2,000	69
Pontypridd colliery (S. Wales)	855	76
Kingswood " (Bristol)	1,769	68
Radstock " (Bath)	620	62
London " (Kentish Town)	1,100	55
Rosebridge " (Wigan)	2,445	54
Monkwearmouth colliery (Durham)	1,584	70
South Hetton " "	1,929	57½
Boldon " "	1,514	49
Whitehaven " (Cumberland)	1,250	45
Kirkland (Glasgow)	354	53
Blythswood "	347	50
South Balgray "	525	41
Carrickfergus, shaft of salt mine (Ireland)	770	43
Carrickfergus, shaft of salt mine (Ireland)	570	40

Selected Observations in Europe, Etc.—*Cont'd.*

	Depth, feet	Gradient feet to 1° F.
GREAT BRITAIN—*Continued.*		
Slitt mine, Weardale (Northumberland)	660	34
Rosebridge	3,680	53
BELGIUM		
Seraing Collieries	1,657	50
FRANCE		
Pont à Mousson	5,104	55
Martincourt	3,937	56
Pas de Calais	4,593	101
Charmoy (Creusot)	3,831	48
Grenelle	1,797	58½
Creusot (Monillarge)	2,674	52
Passy (Paris)	1,926	59
Bonchamp	3,310	49
Saint Andre	830	56
Troyes	409	52½
Rochfort	2,797	50
Anzin Collieries	650	47
CENTRAL EUROPE		
Paruschowitz (Upper Silesia)	6,429	56
Sperenberg (near Berlin)	4,160	59
Czuchow (Upper Silesia)	7,346	54
Wittelsheim (Alsace)	.....	33½
Radersheim (Alsace)	.....	45
Ensisheim (Alsace)	1,936	63
Schladebach (Meiseburg)	4,055	65
Sudenburg (Magdeburg)	1,857	58
Rehme (Westphalia)	2,464	58
Gelsenkirchen coal	2 903–2,500	42–45
Minden	2,408	36
Sennewitz (Halle)	3,555	67
Lieth (Altona)	4,130	65½
Arthern (Thurinzin)	1,092	68
New Salzwerk (Minden)	2,112	51
Sauerbrunnen (Bohemia)	426	58
Vienna	616	57
Schemnitz mines, Hungary	1,368	74
Knurow (Bohemia)	2,293	58
Mondorf (Luxemburg)	2,330	57
Przibram mines (Bohemia)	1,900	126
Saint Gottard tunnel	5,578	82
Mont Cenis tunnel	5,280	79
ITALY		
Naples	1,459	180
RUSSIA		
Petrograd	656	44
SIBERIA		
Yakutsk (frozen ground)	540	54
EAST BORNEO		
Samarinda	.....	30–54
AUSTRALIA		
Port Jackson	2,733	80
JAPAN		
Tokio	1,184	72
MEXICO		
Furbero oil field, Vera Cruz	1,641	42
" " "	2,277	48

Selected Observations in United States.

ALABAMA.— Many observations of temperature of flows, from deep wells show a range from 50 to 100 feet to one degree, a large proportion falling below 75 feet to one degree; at Mobile the rate is 71 feet to one degree.

ARIZONA.— In the Phoenix region the shallower wells show rapid rates, 20 to 40 feet to one degree and deeper ones average 60 feet to one degree. In the plateau north the rates range from 22 to 50 feet to one degree. The rate indicated by the more vigorous flowing wells in San Simon valley varies from 30 to 60 feet to one degree.

CALIFORNIA.— Flows from wells of moderate depth in the orange country of southern California vary somewhat in temperature, especially where there are local hot spring conditions; but the more closely accordant figures give rates near 50 feet to one degree. The many flowing wells in San Joaquin Valley show rates from 35 to 150 feet to one degree, but in the deep wells in the oil fields the range is from 27 to 91 feet to one degree. In Indio Basin most of the many flowing wells 400 to 700 feet deep show no increase in temperature. In Grass Valley gold mines the average rate is 114 feet to one degree.

COLORADO.— Flows from artesian wells in Arkansas Valley show rates from 23 to 54 feet to one degree, mostly from 30 to 40 feet. In San Luis Valley the rate is 22 to 32 feet. At Trinidad 42 feet, at Denver 33 to 52 feet, and at Akron 45 feet to one degree.

FLORIDA.— The great well at Saint Augustine showed a rate of 81 feet to one degree but other wells show rates varying from 43 to 100 feet and some are less.

GEORGIA.— Rates from 57 to 127 feet to one degree are indicated by wells but the data are not reliable.

IDAHO.— High rates of increase are recorded in the State

but most of the observations are in areas over or near young volcanic outflows.

ILLINOIS.— Many Illinois wells have mixed flows from various depths, but evidently the rate is low. Thermometers sunk at Saint John give a rate of 83½ feet and at Streater 97 feet to one degree.

INDIANA.— Data are not reliable but rates from 73 to 118 feet to one degree are indicated.

IOWA.— The flowing wells of Iowa indicate various gradients but most of the data are unreliable owing to mixed flows. Thermometers sunk at Des Moines and Ames gave rates of 109 and 116 feet to one degree respectively. At Davenport 75 feet and at Council Bluffs 83 feet to one degree.

KANSAS.— Most of the gradients obtained in Kansas varied from 50 to 75 feet to one degree, the deep shaft at Lyons Salt mine indicating 74 feet to one degree.

KENTUCKY.— The old deep well at Louisville has gradient of 81 feet to one degree according to one report and 106 feet to one degree according to another.

LOUISIANA.— In the 3,171-foot hole at Belle Island a thermometer sunk to a depth of 975 feet indicated a rate of 73 feet to one degree. In various flowing wells in the State rates are mostly 50 to 80 feet to one degree.

MARYLAND.— One observation at Crisfield on the Eastern Shore indicates a rate of 47 feet to one degree.

MICHIGAN.— It is a fact of great interest that the rate of temperature increase is usually low in the deep mines of the northern peninsula of Michigan, the average being about 125 feet to one degree. Deep wells in the southern peninsula show rates ranging from 45 to 70 feet to one degree. The 3,455-foot hole at Bay City, temperature 97° in bottom, indicates a gradient of 68½ feet to one degree.

MISSISSIPPI.— Flowing wells show varying rates from 43 feet at Biloxi to 211 feet to one degree at Vicksburg.

MISSOURI.— The data from Missouri while somewhat conflicting show low gradients. The 3,843-foot hole at Saint Louis Asylum indicates a gradient of 78 feet to one degree.

MONTANA.— Observations in Anaconda Mine at Butte show an average of about 50 feet to one degree while a flowing well at Miles City indicates a rate of 35 feet to one degree. Flowing wells in Little Bitterroot Valley show an average of 5½ feet to one degree, probably influenced by warm springs.

NEBRASKA.— The flowing wells in Missouri Valley in the northeastern corner of the State indicate rates of increase from 19 to 30 feet to one degree. The wells at Omaha have rate of 85 feet and at Lincoln of 57 feet to one degree.

NEVADA.— The detailed studies of Comstock Lode, made long ago, showed that the rapid rates of increase probably are influenced by volcanic conditions. The temperature of 170 degrees at depth of 3,100 feet indicated a rate of 28 feet to one degree. At Tonopah the rate varies from place to place and with depth and the average is near 40 feet to one degree.

NEW JERSEY.— Flowing wells along the sea coast show an average rate of 50 feet to one degree with exception of Wildwood well in which the rate is to 69 feet to one degree or more.

NEW MEXICO.— A well at Sandia not far southwest of Albuquerque showed a rate of 35½ feet to one degree.

NORTH DAKOTA.— Deep flowing wells in central and eastern North Dakota show rates ranging from 36½ to 56 feet to one degree with an average of 40 feet.

OHIO.— The 2,980-foot well at Findlay showed a rate of 95 feet to one degree with diminished rate as depth increased. The 2,775-foot hole at Columbus indicated 71 feet to one degree and 3,020-foot hole at Plymouth 69½ feet to one degree.

OKLAHOMA.— The rates in Oklahoma were found to range from 34 to 62 feet to one degree, the highest rate being in the central northeastern part of the State.

PENNSYLVANIA.— Several very deep holes in the western part of the State have been carefully tested for temperatures. The 6,299-foot hole 15 miles southwest of Pittsburgh with temperatures of "156° near bottom" (141.3° at 6,100 feet) indicated a rate of about 69 feet to one degree. The 429-foot hole at Homestead had a rate of 70 feet to one degree and the 5,380-foot hole at West Elizabeth 73 feet to one degree. In the anthracite coal field rates vary, most of them from 72 to 140 feet to one degree, a 1,598-foot drill hole at Glen Lyon showing 130 feet to one degree.

SOUTH CAROLINA.— The deep wells at Charleston show a rate from 56 to 61 feet to one degree.

SOUTH DAKOTA.— Several hundred determinations of temperatures of water from deep flowing wells in the eastern part of the State show some remarkable anomalies of variation from rates of 17½ feet to one degree, to 50 feet to one degree closely related to the configuration of the granite or quartzite floor of the artesian basin (consult Darton, N. H., 'Geothermal data in South Dakota,' *American Journal Science*, Vol. V, p. 161, and United States Geological Survey, 18th Annual Report, Pt. IV, pp. 606–611, 1897). The artesian wells near Belle Fourche show rates from 28 to 80 feet to one degree and the 2,965-foot flowing well at Edgemont with flow at temperature of 121 degrees indicated a rate of 39 feet to one degree, the same as two 700-foot holes at Buffalo Gap.

TEXAS.— There are many data from deep holes and wells in Texas. The 3,330-foot well at Manlin with flow temperature of 147 degrees indicates a rate of 41½ to one degree, similar to the rate at Corsicana and some other places. The 3,250-foot well at Fort Worth probably indicates a rate of 18½ feet to one degree if all the flow is from 1,127 feet The Waco wells indicate average rate of 50 feet to one degree. Big Hill in Matagordo County 23½ feet to one degree; Batson 21½ feet to one degree; Sourlake 27½ feet to one degree, the four last in the oil regions where the rate appears to be high.

UTAH.— A few observations in Milford-Beaver region indicate high rates, 12 to 24 feet to one degree.

VIRGINIA.— The investigations by Rogers in coal mines west of Richmond showed gradients of 72 to 84 feet to one degree. In the 2,130-foot hole at Fort Monroe a rate of 64 feet to one degree was found.

WASHINGTON.— Flowing wells in North Yakima Basin show rates of 25 to 36 feet to one degree. At Walla Walla a rate of 41½ feet to one degree was found.

WEST VIRGINIA.— The deepest hole in the world is on the Goff farm eight miles northeast of Clarksburg in northern West Virginia. It was 7,363 feet deep in March 1918, and a test at 7,000 feet showed temperature of 152 degrees, indicating a rate of increase of about 51 feet to one degree. In the 4,771-foot hole four miles southeast of Wheeling the temperature at 4,462 feet was 110 degrees, indicating a rate 70 to 83 feet to one degree. In the 5,236-foot hole at Chelyan near Charleston the rate is 73 feet to one degree; 2,500-foot hole near Mannington 93 feet to one degree.

WISCONSIN.— Temperatures of water from flowing wells in Wisconsin indicated rates varying from 54 to 100 feet to one degree.

WYOMING.— Three deep holes give widely different rates; Cambria 107 feet to one degree, Newcastle 21 feet to one degree and near Meteetsee 54 feet to one degree.

Consult reports of committees to investigate rate of increase of underground temperature (in British Association for the Advancement of Science, reports of meetings of 1868 to 1881, et seq., notably the 52d, 1882, pp. 72–90); Dunker, E., 'Ueber die Wärme im Innern der Erde und ihre moglichst fehlerfreie Ermittlug' (in *Zeit. für prac. Geologie*, November 1896); Jaczewski, 'Uber das thermische Regime der Erdoberflache in Zusammenhang mit den Geologischen Prozessen' (in *Verhand. der K. Russ. Mineral Gesellschaft*, Vol. 42, No. 2, 1905); Koenigsberger and Mühlberg, 'Ueber Messungen der Geothemischen Tiefenstufe deren Technik und Ver Wertung zur Geolgischen Prognose und uber neue Messungen in Mexiko, Borneo und Mitteleuropa' (in *Neuen Jahrbuch für Min. Geol. und Pal.* B. B. 31, pp. 107–157); Abstract in Proceedings Institution of Mining Engineers; Lane, A. C., 'Geothermal Gradient' (Michigan Geological Survey, Annual Report 1901, pp. 244–251); Darton, N. H., 'List of Underground Temperatures in United States' (United States Geological Survey Bulletin No. 701, 1919).

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UNDERGROUND WATERS. See WATERS, UNDERGROUND.

UNDERHILL, John, American colonist: b. Warwickshire, England, 1597; d. Oyster Bay, L. I., 1672. He served in the Netherlands and in 1625 in the Cadiz expedition, in 1630 was summoned by Winthrop to New England to train the inhabitants in martial discipline and in 1634 was chosen from Boston to the Massachusetts assembly. In the Pequot campaign of 1637 he distinguished himself as commander of the New England contingent. His account of the war, 'Newes from America' (1638), was reprinted in the 'Collections' of the Massachusetts Historical Society (3d series, Vol. VI, 1837). Underhill's mode of life and his championing of Antinomianism rendered him very unpopular in Massachusetts. Subsequently he was governor of Exeter and Dover, N. H., and held office in the colonies of New Haven. About 1643 he entered the military service of the Dutch in New York, but he was driven out of that colony in 1653 and went to Rhode Island

where he was commissioned to wage war against the Dutch in New York. Upon the fall of the New Netherlands to the English in 1664 Underhill settled in Oyster Bay, L. I., on a tract of 150 acres ceded him by the Mantinenoc Indians.

UNDERWOOD, Benjamin Franklin, American author and editor: b. New York, 6 July 1839; d. 10 Nov. 1914. At the outbreak of the Civil War he enlisted as a private in the Union army, was wounded and captured at the battle of Bull Run, and was not exchanged until 1862. He then became lieutenant and adjutant in the Rhode Island Heavy Artillery and served until the close of the war, acting in the meantime as war-correspondent for the Newport, R. I., *News*. He was engaged in lecturing for 30 years after the war and in 1870–85 he was particularly prominent as an exponent of religious "free thought." He was business manager and coeditor of the Boston *Index* in 1880–86 and in 1887 was engaged in a like capacity on the Chicago *Open Court*. He edited the *Illustrated Graphic News* in 1888, the *Philosophic Journal* in 1893–95, has written editorially for the *Free Thought Magazine* since 1893. He was secretary of the Psychical Science Congress at the Columbian Exposition in 1893 and has published 'Influence of Christianity on Civilization' (1871); 'Spencer's Synthetic Philosophy' (1891); 'Utilitarian Ethics' (1903), etc.

UNDERWOOD, Francis Henry, American author: b. Enfield, Mass., 12 Jan. 1825; d. Edinburgh, Scotland, 7 Aug. 1894. He was educated at Amherst College, studied law in Kentucky, and was admitted to the bar in 1847. He returned to Massachusetts in 1849, was appointed clerk of the State senate in 1852, and in 1854 became literary adviser of the Boston publishing house of Phillips, Sampson and Company. The establishment of *The Atlantic Monthly*, by that firm, was due to him and it was he who secured James Russell Lowell as editor-in-chief, Underwood being assistant editor. Two years later his connection with the periodical came to an end, and from 1859 to 1870 he was clerk of the Supreme Criminal Court, Boston. He subsequently devoted himself to literary work till 1885, when he was appointed to succeed Bret Harte as consul at Glasgow, and while in Scotland he lectured on American literature. His term of office expired in 1889 and he returned to the United States for a time, but in 1893 was appointed consul at Edinburgh. He was the author of 'Handbook of English Literature' (1871); 'Handbook of American Literature' (1872); 'Cloud Pictures' (1873); 'Lord of Himself,' a novel of Kentucky life (1874); 'Man Proposes,' a novel (1880); 'The True Story of the Exodus,' an abridgment of the work of Dr. Brugsch-Bey (1880); biographies of 'Longfellow' (1882), 'Lowell' (1882), and 'Whittier' (1883); 'Quabbin' (1890); 'Dr. Gray's Quest' a novel (1896). His best work is seen in 'Quabbin,' a sympathetic study of life in a small New England town two generations ago. He was endowed with a strong personality, had a wide acquaintance with books and men, possessed a fine critical sense and not a little literary power, but was to some extent lacking in constructive skill and character delineation.

UNDERWOOD, Horace Grant, pioneer missionary in Korea: b. 19 July 1859; d. 12 Oct. 1916. Born in London, he came to America at the age of 12 and was educated in the New York University and New Brunswick Theological Seminary. Arriving in Korea, under the Presbyterian Board, United States of America, in 1885, he began explorations and researches, showing an aptitude for mastering the language and an intensive energy in every sort of service to the people and rulers, from practical hygiene and education, to the counsel of royalty, while ever ardent and wise as a promoter of Christian unity, in continuous toil, from 1885 to 1915. Editor, preacher, teacher, he eschewed offers from the king of political honor and emolument. Was chairman of the board of Bible translators, from 1887 to 1911, and of the Korean Tract Society; professor of theology in the Korean Theological Seminary 1907–15; head of the Korean Educational Federations; principal of the John D. Wells Training School 1907–15, and founder of the Christian College in Seoul. Lecturer in America on Foreign Missions. At his death there were 46 Protestant Christian churches within a radius of six miles from the centre of Seoul, the capital. He was author of a Korean-English and English-Korean Dictionary (1889); 'Introduction to the Korean Spoken Language' (1890); 'The Call of Korea' (1908); 'Religions of Eastern Asia' (1910). Consult the biography by his wife, Lilias Sterling Horton, herself physician and missionary, married in Korea in 1889, and author of 'Fifteen Years Among the Topknots' (1904); 'Underwood of Korea' (1918).

UNDERWOOD, John Cox, American soldier and civil engineer: b. Georgetown, D. C., 12 Sept. 1840. He was graduated as a civil engineer at the Rensselaer Polytechnic Institute, Troy, N. Y., in 1862, and served with distinction in the Confederate army during the Civil War, reaching the rank of lieutenant-colonel. For nearly a year he was held as a prisoner at Fort Warren. In 1870–72 he was mayor of Bowling Green, Ky., and during 1866–75 served as city, county and consulting State engineer. From 1875 to 1879 he was lieutenant-governor of Kentucky. He was prominent in several secret fraternal organizations and Confederate patriotic societies; and in 1896 was chosen superintendent and secretary of the Confederate Memorial Association.

UNDERWOOD, Lucien Marcus, American educator and botanist: b. New Woodstock, N. Y., 26 Oct. 1853; d. Redding, Conn., 16 Nov. 1907. He graduated from Syracuse University in 1877 and was professor of botany there 1883–91. From 1896 he was professor of botany at Columbia. He published 'Systematic Plant Record' (1881); 'Our Native Ferns and How to Study Them' (1881–1901); 'North American Hepaticæ' (1884); 'Our Native Ferns and Their Allies' (1888); 'Hepaticæ Americanæ' (1887–93); 'Moulds, Mildews and Mushrooms' (1889). Consult Bonker, H. J. (ed.), 'Underwood Families of America' (1913).

UNDERWOOD, Oscar Wilder, American legislator: b. Louisville, Ky., 6 May 1862. Educated at the University of Virginia he was admitted to the bar in 1884 and practised in Birmingham. He was chairman of the Democratic

committee that adopted the present constitution of the State, was member of Congress (1895–1915) and was elected United States senator (1915–21). He is a prominent leader of the Democratic party and its chief tariff expert. He was a popular candidate for the presidential nomination in 1912.

UNDERWRITER, one who insures, or makes a business of negotiating contracts of insurance. The term is particularly employed in connection with marine insurance. More recently it has come to be used in relation to certain modern financial conditions. Upon the organization of a corporation to absorb several companies, it is customary to raise a sum of money to be employed either as a working capital or for the purchase of such stock in the companies as original holders are unwilling to exchange for the new securities of the corporation. The one employed in raising this sum is styled the underwriter. See INSURANCE; INSURANCE, LIFE, IN AMERICA; INSURANCE, MARINE; FIRE INSURANCE IN AMERICA; UNDERWRITING.

UNDERWRITING, in finance, a method of floating the bonds and securities of large corporations by means of fiscal agents or syndicates. The general rule governing the underwriting of new securities is that the syndicates shall receive a commission of 5 per cent on the value of the securities underwritten. As an illustration take a railroad issuing $50,000,000 of bonds. The railroad, it may be presumed, is of good standing, and the security excellent. The company prefers, instead of securing a high premium on the bonds, to save in the annual interest charges. So it issues a 3½ per cent bond, with the probability that it will sell at par, or perhaps higher. The underwriters agree to take the entire issue, say at 98, but it charges a commission of 5 per cent, or about $2,500,000, for labor, expense and risk attending the operation. The railroad is now secure. It is assured of the money it needs for which it has, indeed, paid a liberal discount, but no more liberal, proportionately, than would be required in procuring a modest loan in the ordinary market channels. The syndicate must now sell the bonds. If there is an active investment demand, it may be able to accomplish this at once, at a considerable advance over the underwritten price of 98. Suppose it sells at 102, the syndicate would then reap a profit of 4 per cent, or $2,000,000 in addition to the commission of $2,500,000, less, however, the cost of advertising, wages, attorneys' fees and other incidentals. But if the demand were not as great as had been anticipated, the syndicate might find itself with millions of dollars of securities on its hands, for which it must pay, but for which there is no adequate market.

UNDINE (1811), the first notable writing of La Motte-Fouqué, is a classic of romantic daintiness. "The fragrance of poetry and the songs of the nightingales," said Heine, "were put into words by Fouqué and he called it Undine." The tale's prosaic framework is this: Knight Huldbrand finds at a fisher's hut, Undine, a foundling water sprite, who to win herself a soul through marriage has taken human shape, while still warned, guarded and served by her native element, embodied in her uncle, Kühleborn. Undine marries Huldbrand, gains a soul, but must lose life if she cannot hold him true to her love. Her nature is transformed to a tenderness that embraces even her companion and rival Bertalda, discovered to be the fisherfolk's daughter. Kühleborn, warning, threatening, is repelled. Undine loves too fondly, till at last Huldbrand's vagrant affections break the spell, and Undine melts from his presence, but not from his life. For she has kept her soul and, when warnings cannot keep him from Bertalda, returns on his wedding eve to draw away his life in a kiss and, as a perennial spring, to clasp his grave in her embrace. The tale, as a legend of the Ritter von Staufenberg, dates from 1400. It was retold by Fischart and mystically interpreted by Paracelsus in his 'Liber de Nymphis' (1590). As poetized by Fouqué it won immediate popularity, was made subject of three operas, widely translated and illustrated by noted artists. Consult Pfeiffer, W., 'Über Fouqué's Undine' (1903).

BENJAMIN W. WELLS.

UNDISCOVERED COUNTRY, The, a story by W. D. Howells, published in 1880. The central figure, Dr. Boynton, an enthusiastic spiritualist, is an admirable study of an honest charlatan. He has become a monomaniac on the subject of spiritualistic manifestations and, branded as a cheat, with his daughter seeks refuge in a community of Shakers, whose quaint and kindly ways are portrayed with a loving pen.

UNDUE INFLUENCE, a legal term of frequent use in testamentary suits, and sometimes in cases of contested elections. Undue influence in the making of a will is exerted when the testator is so unnaturally influenced that he makes his will in favor of some one other than his natural heirs,—undue influence being oftenest charged when the testator's mind was infirm or weakened by illness and his will was made while he was under the supervision of the outside beneficiary. Where undue influence is proved the court will set a will aside or allow compensation. See WILL.

In voting, undue influence consists of force, violence, restraint, threat or intimidation practised at the polls to influence votes to the way of thinking of the person making such demonstration. When proved it vitiates the result to the polling and lays the perpetrator open to penal action, with severe punishment. The burden of proof rests on the party making a charge of undue influence. See CORRUPT PRACTICES ACTS.

UNDULATORY THEORY OF LIGHT, or WAVE THEORY OF LIGHT, the theory which accounts for the phenomena of light and radiant heat, by interpreting them as the results of vibratory movements or undulations, in an all-pervading medium called the "ether" (q.v.). There are many optical phenomena which admit of a ready mathematical explanation in this manner, without making any very definite assumptions concerning the nature of the ether, or the kinds of motion that occur in it. In order to explain the phenomena of polarization, however, it is necessary to assume that when a light-ray passes through the ether, the ether is disturbed in such a manner that its particles oscillate back and forth in paths

which are perpendicular to the direction in which the light-ray is traveling. In this respect the motion of the ether is very different from that which prevails in air when a wave of sound traverses that medium; the motions of the air particles in the case of a sound-wave being to and fro along lines that are parallel to the direction in which the wave is progressing. The motion of the ether when a light-ray traverses it is supposed, in fact, to be very similar to the motion by which a vibratory disturbance is propagated from one part of an incompressible elastic solid to another part; and for this reason the undulatory theory of light is often called the "elastic-solid" theory.

Christian Huyghens was the first to give the undulatory theory of light a definite form, and the origin of that theory may fairly be said to date from a paper written by him for the French Academy of Sciences, in 1678. Sir Isaac Newton was well aware of the possibility of accounting for many of the phenomena of light, by assuming that light consists of a kind of wave-motion in an all-pervading ether; but he objected to the undulatory theory, because he could not understand how a body could cast a sharp shadow if that theory were correct. He was of the opinion that the waves would necessarily sweep around obstacles, and close in behind them in such a way as to render sharp shadows impossible. Newton, therefore, adopted the alternative "corpuscular theory," which teaches that light consists of storms of tiny material particles, or "corpuscles," which tend, by reason of their inertia, to travel in straight lines. He developed this theory with characteristic power and ingenuity, so that physicists were long divided between his teachings and those of Huyghens. In 1801, Dr. Thomas Young, an English physicist, solved the difficulty which led Newton to reject the undulatory theory; for he showed that when the dimensions of an opaque object are very great in comparison with the wave-length of light, the light-waves which fall upon the object are prevented from sweeping around and closing up behind it, by means of the phenomenon known as "interference"; those waves which tend to pass around behind such an obstruction becoming compounded together in such a manner as to neutralize one another. Young's discovery stimulated investigation so that within the next 20 years great advances were made in the development of the undulatory theory. Young and Fresnel, for example, explained the phenomena of polarization, and Fresnel developed his beautiful theory of the optical phenomena manifested by crystals. The objections raised by Newton had been entirely disposed of, and the undulatory theory had been placed upon an apparently firm foundation. Moreover, there are two things about the corpuscular theory which appeared to be absolutely fatal to it. The first is, that it does not lend itself readily to the explanation of interference. It is easy to understand that two waves in the ether may come together so as to neutralize each other; for an analogous phenomenon may be seen any day at the seashore, in ocean waves. It is not at all easy to understand, however, how two streams of light-producing corpuscles can produce darkness, when either stream alone will produce light. Another even more fatal objection to the corpuscular theory was, that this theory cannot explain refraction unless it is admitted that light travels faster in a dense medium than it does in a rarer one, while the undulatory theory requires that the light shall move faster in the rarer medium. Fizeau and Foucault proved by direct experiment that light travels faster in air than it does in water; and hence it was considered that they had proved that the corpuscular theory is not correct.

About the middle of the 19th century Michael Faraday published his experimental researches on electricity and magnetism; and although these did not deal particularly with light, it happened that they had a most important ultimate influence upon our views as to its nature. Maxwell, in studying Faraday's work and endeavoring to reduce his experimental results to a consistent mathematical theory, conceived the idea that light may be merely a periodic or vibratory *electrical* disturbance in the ether. Upon working out this idea in detail, Maxwell found that the new theory is free from many of the objections that had developed in connection with the older elastic-solid theory; and the "electro-magnetic theory" of Maxwell is now held by nearly all physicists, in preference to the older undulatory theory. The difference between the two is somewhat as follows: Maxwell agrees that light is some sort of a periodical disturbance in some sort of an ether, and he also agrees that the displacements that occur as the wave progresses are perpendicular to the direction in which the wave travels; but he teaches that these displacements are not analogous to those that are produced in an elastic solid when that solid is deformed. He considers that they are of an electrical nature, and that we must learn about them, not by observing the behavior of elastic bodies under stress, but by observing the phenomena exhibited by electrified bodies. In one sense, therefore, Maxwell's theory may still be regarded as a form of the undulatory theory; but the waves that are contemplated by it are electrical in nature, and are not strictly analogous to the waves in an incompressible elastic solid. See ETHER; LIGHT; RADIATION; RADIOACTIVITY; X-RAY.

ALLAN D. RISTEEN.

UNEMPLOYMENT. In the sciences of economics and sociology the term unemployment refers to an industrial condition in which large numbers of workers are without gainful occupation. No doubt in feudal times the working classes found during trade depression, war periods and other cataclysms periods of inactivity leading to poverty and even hunger. But in those days it was not a cry issuing from hungering masses closely congregated as at present. In the early days of the artisan manufacturing units consisted of small individual "shops" where work was performed by apprentices and journeymen artisans mostly. And when the master craftsman had filled all orders and had no longer work for all, the journeyman went on his way to the next village or city seeking another job. The condition was general and provided for. The workman had his lodging-house in every town or village where, at small cost or free, he obtained board and lodging till he had canvassed the trade and ob-

tained his job or left for the next settlement. His "papers" showed the signature of his former employer as proof of his good standing and he was aided in his quest for work by the state. With the growth of the cities, and consequently of the industries supplying them, manufacturing establishments grew into factories where the larger units could use more economy in methods besides producing in larger quantities at reduced cost. It was the opening of that stage of civilization known as industrialism. And with these ever growing aggregates of manufacturing industries forming themselves into trade centres with their great populations of "hands" or operatives was brought into being the hideous feature we know as "unemployment." Its paradoxical phenomenon is conspicuous in the fact that with the growth and increasing prosperity of the industries we find shoe factories closed in the midst of crowds of shoeless able workers whose presence forces on one's knowledge that the need or demand for footgear is great; the huge clothing factories shut down their operations while many thousands of willing workers stand outside shivering from lack of apparel with which to protect themselves against the elements.

Problem.— In a statement of the features of the subject of unemployment must not be omitted notice of the fact that large numbers of healthy and willing workers unable to find employment carries with it the direct consequence of indignation and "unrest" among the populace generally of wage-earners, a disease of the body politic that at any time is a breeder of anarchists and revolution. Again another degrading influence of unemployment is its demoralization of the suffering working classes who lapse easily into beggary and morally and physically deteriorate so as to become *unemployable*, as inefficient and unreliable. Like most diseases unemployment in an industry is infectious. The enforced idleness of these thousands affects other thousands in other trades as the penniless state of numerous members of a community forbids demand and consumption of goods produced by its other members, and the sales of other commodities being reduced causes other factories to be closed down. And thus the entire chain of industry from factory to retailer, consumer, capitalist, banker, etc., is drawn, link by link, into the commercial vortex of panic.

Causes.— The direct and primary cause of the "shut-down" of factories which produce unemployment on a large scale is one of supply and demand, generally, depression of trade, *overproduction* (usually meaning enforced reduction of consumption, an outcome of trade depression). Factors also leading to reduced demand are: changing fashions, overspeculation, hoarding of capital caused by commercial fears, etc. War and panic often bring about unemployment in its worst degree. In a less degree new inventions, changes in national policy (prohibition will close up breweries and distilleries, besides saloons, etc.), excessive immigration, bad labor laws, labor disputes. Other more or less potent factors are: lack of material, weather, etc. Causes within the industry itself are numerous such as: "seasonal" employment with its fluctuations in consumption, child labor, additions to the forces by female operation, *casual* employment as that of longshoremen and stevedores, coal passers, all dependent on the arrival of ships in the port. The causes of unemployment are legion and many are insidiously invisible. Experts on the subject declare *casual* employment works with demoralizing effect on the wage-earners, creating discontent and inefficiency from the periods of idleness. On a smaller but more chronic scale we have numerous unemployed among the aged, debilitated, defectives, vagrants, etc.

Statistics.— In the United States there is not even a *system* by which to get at the statistics of the unemployed as was painfully evidenced during the great distress of 1914, when so many philanthropically inclined desired *facts* as to the extent of the far spread misery and want. Unemployment has not been considered sufficiently important to build up an organization or gathering the data of distress from period to period. American statistics on unemployment are limited to several "investigations" set in operation at different times by missions, lodging houses, bread lines, relief organizations and other heterogeneous agencies. The 1900 Federal census tells us 22.3 per cent of persons having gainful occupations were out of work some time during the year and more than 2,600,000 men and about 500,000 women were out of work seven months or more. The 'Report of the Massachusetts Board to Investigate the Subject of Unemployment' (1895) contains some statistics. The Federal Bureau of Labor made an investigation in 1901 as to the cost of living among 25,440 families of the working classes and those with salaries of $1,200 or less, and discovered 49.81 per cent of the heads of families were idle part of the year. The Geological Survey in its report on mining conditions from 1890 to 1910 shows 22 to 43 per cent of the miners' time was lost annually in the bitumenous region and the anthracite miners lost 23 to 50 per cent in other years than 1902 when the great strike was active. The Wainwright Commission in New York State in 1909 investigating employers' liabilities and allied matters found: "There were no statistics available from which to compute the actual number of those out of work," but they estimated at least 3 per cent out of work in the State's industries of those regularly employed and 8 to 10 per cent in winter. This rate increased to from 15 to 40 per cent in 1908 during the business depression. Of organized labor, where some systematic methods of obtaining employment for its members prevail, the New York State Department of Labor collected monthly the reports of the unions from 1901 to 1911, which showed an average of 14,146 unemployed each month out of an average membership of 99,069, or 18.1 per cent. This is skilled labor. New York State Commissioner of Labor found out of 600,000 organized wage-earners 101,000 idle (16.1 per cent of men) in 300 trades or branches between September 1912 and September 1913 (a bad year for labor), and growing to 38.8 per cent on 31 December 1913. Of this 92 per cent of idleness was due to lack of work and 2 per cent due to labor disputes. While the deplorable statistics given above apply to New York State, New York City had the still higher figure, ending December 1913, of 45.5 per cent with over 90 per cent of the clothing trades of this city idle and two-thirds of the union men members of the building trade. The industries themselves have no records or particulars of unemployment. In this

same stray manner the temporarily organized appointees under the Federal Industrial Relations Commission, in 1914, sent a sheet of eight questions to the chiefs of police of the cities of the United States to get at the underlying causes of industrial unrest, four of which questions concerned the unemployed in each city. It was unaccompanied by any instructions as to a system of investigation, and from this and other causes the figures forthcoming are absolutely unreliable. Women were excluded from the inquiry and we have over 8,000,000 female wage-earners; political influence on the replies suppressed or "softened down" facts unquestionable in some locations. With the utter lack of reliable statistics in this country we are liable to look to Europe for such figures of unemployment; as this industrial disease has been more malignant in the old country greater research and more remedies are discoverable there. But as to whether we can utilize such foreign statistics as a measure on which to base our activity here or whether to adopt such remedies as may have proven efficacious in France, England or Germany, we are in doubt. Whether they would prove available in the United States labor field is dubious, surrounding conditions being so very different in many respects.

Relief and Remedy.— The past World War has proven that labor can be mobilized by our government, and such an experience might lead us to suppose that this last great disaster might be the means of opening our eyes to an effective method of treatment of this economic disease of unemployment by the Federal government. The Teutonic attempt at world invasion should be accepted as an eye-opener to us that our deficiencies in politics and economics are so dangerous as to render our very stability as a republic doubtful. Anarchism and other features we now call "unrest" of the laboring classes are best (and probably only) to be fought successfully with a perfectioning of our industrial system and one that will eliminate unemployment. The war has given us both the opportunity and vision of the necessity of industrial reform. The nation must come to a decision that the question of unemployment is one of the great national issues and should be treated by Federal and State governments as one of the foremost problems and one of the permanent, not emergency, official duties due its people. The national effort to find employment for the returning regiments of the American Expeditionary Forces has brought us the hitherto lacking experience of handling that branch of the labor problem. Whether we shall gain from the experience permanent advantage the future alone can tell. As to mitigating methods against the evil many of the advanced students of the problem assert that teaching the artisan to be expert in more than one line of manipulation, so as to take up vacancies elsewhere when the operations he performs have no demand, would reduce the ranks of the unemployed to a considerable extent. There are many agencies fighting to reduce the number of sufferers from unemployment of which space permits mention of but a few. Some of these give their services free, others charge a nominal fee to veil the appearance of charity. Like the professed "intelligence offices" they spend a large part of their endeavor in locating vacancies in the industries. There are numerous public employment bureaus. Forty-six States have had laws passed providing free employment bureaus. Municipal bureaus of independent origin and operation are established in many United States cities. The municipal lodging houses do their small quota of placing their distressed lodgers in service, and the New York social service bureaus attempt to organize the units into one whole of enlarged usefulness. In 1914 the Bureau of Immigration of the United States Department of Labor started 38 branch offices in different sections through which much usefulness may result.

As to "relief" agencies of philanthropic effort, the danger lies in the fact of their tendency to reduce the moral status of the assisted workers. This may occur by allowing the form of administration of assistance to be openly "charity" work or by creating in the recipients habits of idleness, in both of which cases the agency is creating mendicants or dependents instead of maintaining the needful feeling of independence and the desire for active and gainful occupation. The general theory is, therefore, that philanthropic assistance shall be exerted only in behalf of those incapable of strenuous labor, such as the aged, debilitated, wounded, etc. A class of recent assistance to employment is represented in the Jewish Agricultural Aid Society and the Industrial Removal Office of New York City. But their function is mainly to place freshly-arrived Jewish immigrants in agricultural occupations and thereby avoid these from becoming additional competitors in this already overcrowded city. The plan of activity practised by the agencies of the churches, missions or parish houses have been usually on a pseudo self-supporting basis of fees. Of a similar character is the employment department of the Salvation Army and Volunteers of America, covering a large sphere of usefulness in both skilled and unskilled ranks of labor, where work accompanies the assistance as a reciprocal. There is also the Inter-Church Committee on Unemployment of the New York City Federation of Churches with activities of the broader scope. The Y. M. C. A., the Y. W. C. A., etc., employment bureaus carry out their part of the program for clerical and business employees unemployed. The National Employment Exchange *places* quite a number of workers of all kinds and charges fees. One expert at least is of opinion that the quantity of small employment agencies of the free order is too large and the effort should be diverted to large clearing houses of labor closely in co-operation with organized labor and organized business, all "relief" or "welfare" work being restricted to emergency and disability cases. Civic organizations recently have taken up this important problem of unemployment in other branches of activity than the locating of work for unemployed labor. Of such are The American Association of Labor Legislation, the Committee for Immigrants in America, whose work is the stimulation of labor legislation, propagation of public interest in the unemployment problem, etc. The defect of all the above agencies is lack of combined organization, being strictly local or independent in action.

A general survey of the situation would

make it appear that logically there are two main points of attack in the unemployment problem. (1) The temporary *amelioration* of a prevailing condition (relief on civil, State, Federal or philanthropical lines); (2) the *eradication* of the condition, preferably by Federal organization (it is a *national* disease). But the latter course calls for the co-operation of the industries themselves. A commencement of the United States intervention in this great national issue was the establishment of the Department of Labor with its secretary a member of the Cabinet in the United States government, created 1913. An early act was to establish 18 zones "for the purpose of facilitating the distributing of farm labor in the United States, with headquarters in the large cities. Several annual meetings of the International Conference on Unemployment have brought forth theories and useful discussion with interchange of views, and we must hope that there will arrive a decision for some definite course to pursue for the extirpation of this international evil. From the National Industrial Conference held at Washington, D. C., 1919, good results must be hoped for, as it brings capital and labor into direct negotiation and both armies of production have now been trained to the knowledge that *singly* their efforts at profit-making and producing are nugatory.

Practically all the above enumerated agencies are factors for *relief*, for the allocation of unemployed labor, not for the eradicating of unemployment, for remedy, not cure, which, after all, is the main part of the problem for solution. These existing, mostly disconnected, sources of relief do not increase the volume of work nor regulate the industries from which work emanates. Experimental efforts are being brought to bear more or less in this direction. For creating work, charitable associations have established emergency industries, such as woodyards; sewing-rooms for women; some cities have established road-building systems to afford extra work (including the quarrying and crushing of the stone for same) and other public works. This, however, is closely on a line with the snow-removal winter work of the cities. But plans for the reduction of the causes of unemployment in the industries, the equalizing of labor demand for the *seasonal* industries, for instance, has been of a strictly individual and sporadic nature. The nearest approach to this solution is, probably, the recent attempt of a large automobile concern to work its maximum output during the winter months and make its slack season during the summer, thus releasing its operatives for work on the harvesting. Another method recently employed by several industries is to make a reduction of the hours of labor so as to spread the work over a larger number of employees and thus avoid the throwing out of work so many operatives. Some of the larger unions pay their members something during their unemployment out of their assessments, and the labor unions in general look after obtaining work for their members — this is the fruit of *organization*, that mainspring from which in the end, many experts tell us, must arise the eradication of unemployment. This matter of organization, from present aspects, is likely to take some form of "socialization" of the interests of capital and labor in the different industrial establishments, a closer relation between employer and employee, as is being quite forcibly done in England since the World War. The Commission on Industrial Relations and other recent activities tend to show that, at least, this nation is awaking to the fact of the immensity of the problem from a national as well as social need.

Unemployment insurance has taken rapid strides, even becoming a state measure among several European nations, and has had much discussion in this country. Its purpose is, however, the lessening of distress of the unemployed and is no cure for the disease. The Ghent System holds a high place in this class of labor reform. The National Insurance Act (1911) in England followed the failure of the working of the Unemployed Workmen Act, and was a move in the direction of providing against too great distress of the unemployed, but its small weekly dole does nothing much toward reducing non-employment. Germany has shown the path to a systematic plan of avoiding the non-employment evil with its government free employment offices and bureaus for all classes of labor and its trade committees formed of employers and employees in equal numbers, besides its citizens' committees in charge of the bureaus. Its free shelters (*Herberge*) or hotels for journeyman artisans is an ancient institution. These systems are all, possibly, unadaptable to American conditions, without modification, but they lay down methods of control that may be shaped into such form as to be practicable in the United States. The amount of public discussion of this enormously important subject which has found its way into print may be conjectured by the fact that 'Selected Articles on Unemployment,' compiled by Julia E. Johnsen (New York 1915), has a bibliography of 22 pages.

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UNGAVA, ŭng-gā'va, Canada formerly, a northeastern territory formed in 1895, in the Labrador peninsula since 1912 the Territory of New Quebec. It is bounded on the north by Hudson Strait, west by Hudson Bay and James

Bay, south by Quebec, and east by the Atlantic. Area, 351,780 square miles. Ungava Bay, in the north of the district, opens into Hudson Strait. Pop. 14,000 of whom 8,000 are whites, 2,000 Eskimo and the remainder Indians. Consult 'Reports on Ungava, recently Added to the Province of Quebec, under the name of New Quebec' (Quebec 1915).

UNGER, ŭng'ĕr, **Frederic William,** American journalist: b. Philadelphia, 25 Jan. 1875. He was educated at the Eastburn Academy, Philadelphia, and after studying for the ministry and for the bar, abandoned both for journalism. He was attached to Lord Roberts' headquarters as staff correspondent for the London *Times* during the South African War. He published, 'With Bobs and Kruger' (1901).

UNGULATA, a great and heterogeneous group of hoofed mammals which first appeared in the Eocene period as small marsh-dwelling forms scarcely distinguishable from the contemporaneous ancestors of the *Carnivora,* but which early became differentiated into several quite distinct series that have continued to diverge until in the living fauna they terminate in quite isolated groups. Under these circumstances it is not surprising that the opinions of zoologists differ greatly concerning the classification of these animals. Without considering the changes in classification that have followed increased knowledge of the living forms, it may be said that if the latter alone were considered they would fall naturally into three distinct groups; one typified by the horse, ox, pig, etc., another by the elephant, and the third by the coney (*Hyrax*). But with the great palæontological discoveries of recent years, especially in the Eocene of Wyoming and other Western States, and in the later formations of Patagonia, not only have these groups been connected by annectent forms, but several totally new types have been found, and generalized ungulates have been shown to intergrade with the *Carnivora* on the one hand and with the *Rodentia Quadrumana* on the other. By some zoologists, as Cope, each of these principal groups, or radiating descent-series, has been given a distinct ordinal name. Others have grouped all together as a single order, with numerous subdivisions. As the latter arrangement is best adapted to the needs of the present article it is here followed.

In this broad sense the *Ungulata* have on each foot from one to five digits, terminated by broad, blunt nails or hoofs. With a very few exceptions among extinct primitive forms they are digitigrade and many of them walk on the very tips of the toes. The scaphoid and lunar bones of the wrist are always distinct. Well-marked milk and permanent dentitions are always developed, and with a few exceptions these animals are strictly terrestrial and herbivorous. Evolution in this group has particularly affected the feet and teeth, with the other digestive organs. Correlated with the replacing of marshy forests by dry, grassy plains these animals increased in size and developed greater speed in running by a reduction in the number of digits from five to two or one, by the union of certain bones of the foot and lower leg, and by a change in the position of the carpal and tarsal bones, so that they alternate and interlock. As the soft succulent vegetation of the swamps gave way to the wiry grasses of the plains the teeth gradually changed from a tuberculate low-crowned form to one with crescentic and then complexly-folded enamel ridges, and a high persistently growing crown. Although similar changes have been traced in many families, they are shown in greatest perfection in the horses, where every step in the evolution from the four-toed, low-tooth-crowned *Orohippus* of the Eocene, with well-developed ulna and fibula, to the one-toed, complexly high-crowned modern *Equus* with the greatly reduced ulna and fibula completely ankylosed with the radius and tibia respectively. See HORSE, EVOLUTION OF.

A subdivision of all the *Ungulata* into *Ungulata Vera,* or true ungulates, and *Subungulata* is generally followed, though this, as indeed every sharp subdivision of the ungulates, is obscured by known fossil species. The *Subungulata* is a rather heterogeneous assemblage of the more primitive forms, in which the bones of the carpus and tarsus are not at all or only partially interlocking, the toes often five in number, and the feet sometimes subplantigrade. Some of the extinct forms have well-developed clavicles. In the living species the mammary glands are, at least in part, situated on the breast, and the placenta forms a zone or broad band. Besides the many remarkable extinct groups placed by Cope in the orders *Taxeopoda* (*Condylarthra*), *Toxodontia* and *Amblypoda,* the *Hyracoidea* and *Proboscidea,* represented in the modern fauna by *Hyrax* and the elephants, belong here.

The *Hyracoidea* and family *Hyracidæ* comprise only a few species of small rodent-like animals of the genera *Hyrax* or *Procavia* and *Dendrohyrax,* inhabiting Africa, Syria and Arabia. They present certain resemblances to the elephants on the one hand, and to the rhinoceroses on the other, but in most respects are quite isolated. The *Hyrax syriacus* is believed to be the "coney" of Scripture. The front feet have four and the hind feet three toes, enclosed in hoof-like nails. No clavicles exist. The nose and ears are short, and the tail is rudimentary. No canine teeth exist, and the incisor teeth grow from permanent pulps like those of rodents. The placenta is zonary and deciduate, and there are six teats. The intestine is remarkable in having a large sacculated and a pair of small conical cæca. These animals live in burrows in rocky mountainous districts, and are known as "rock-rabbits" or "dassies," while the species of *Dendrohyrax* are arboreal and live in hollows of trees.

The elephants (q.v.), although usually placed in a distinct order of mammals — *Proboscidea,* are related to the other ungulates through the *Hyracoidea* and *Amblypoda.* Each foot possesses five toes. There are no clavicles. The nose is prolonged to form a flexible proboscis, at the extremity at which the nostrils open. The testes are abdominal throughout life. The breasts are pectoral in position, and the placenta is non-deciduate and zonary. The canine teeth are wholly wanting, and the molars are few in number and are ridged or tuberculate on their crowns, very high and complex in structure in the specialized forms and appear in the jaws from behind, one at a time. The upper incisors

grow from persistent pulps and form tusks. No lower incisors are developed in the elephants but existed in *Dinotherium* and some species of *Mastodon*. The extinct *Proboscidea* are of exceptional interest. The various species of mammoth, mastodon, etc., which belong to the family *Elephantidæ*, possessed enormous tusks curved nearly into a circle in the former, straight in the latter, and their remains are associated with those of early man. The *Dinotheriidæ*, remains of which are found in the Pliocene formation, possessed simple tuberculate molars and the lower incisors were greatly enlarged to form downwardly-turned tusks, on which account these animals were formerly associated with the walruses.

The *Ungulata Vera* (or *Diplarthra* of Cope) include the great majority of living ungulates, most of which are highly specialized in respect to foot and tooth structure. They never have more than four fully-developed toes on each foot; these toes being provided with hoofs, and are never plantigrade. No clavicles or collar-bones are developed, though transitory ones sometimes occur during fœtal life. The placenta, which is either diffuse or cotyledonary, is of the non-deciduate type. The molar teeth have broad crowns and vary in the different families. The mammæ or milk-glands of the female are usually few in number and placed in the groin; or more numerous and abdominal. The intestine is very usually provided with a large cæcum; and the stomach may be complex. Regarding the classification, a primary character is found in the number of the toes, with which many other characters are correlated.

The section *Perissodactyla* includes those forms in which the toes are usually present in an odd number (solid-hoofed). The third or middle toe tends to predominate, while in the *Artiodactyla* the number is even and the second and third predominate (split-hoofed). The dorso-lumbar vertebræ (that is, the vertebræ of the back and loins collectively) do not number less than 22. The dentition varies, but the premolars and molars are always similarly formed. The third digit or toe of each foot is symmetrical by itself, that is, does not form a pair with its neighboring digit. The thigh or femur bears a third trochanter. The stomach is of simple character, and the cæcum of very large size. The teats are inguinal in position and the placenta is diffuse. If horns are developed they belong merely to the epidermis, are not supported by a bony core, and are never paired in living forms. Where two horns exist (as in some rhinoceroses) the second is situated behind the first. Belonging to the perissodactylate *Ungulata*, besides many extinct Teritary families, are three living ones typified by the tapirs, rhinoceroses and horses (qq.v.). The group is declining.

The *Artiodactyla*, or "even-toed" ungulates, are distinguished by the presence of either two or four toes, the third toe of each foot forming a symmetrical pair with the fourth. The premolar teeth, whatever their character, are always simpler than the molars. When horns are developed they nearly always exist in pairs, and are supported on bony "cores." The stomach is very complex in the ruminating forms, and the cæcum is small. The dorso-lumbar vertebræ number 19, and the femur wants a third trochanter. Unlike the *Perissodactyla* the *Artiodactyla* are a dominant group and, while in the early Tertiary times they were surpassed by the former in number and variety, they have steadily progressed as the latter have declined, and to-day are represented by about one-third of the known families, very numerous genera and species and often vast numbers of individuals. The living families are arranged under the sections *Suina*, or pig-like *Artiodactyla*, *Tylopoda*, or camel-like *Artiodactyla*, *Tragulina*, the chevrotains, and *Pecora* or ruminants.

Consult Flower and Lydekker, 'Mammals' (London 1891); Lydekker, 'Wild Oxen, Sheep and Goats' (London 1898); 'Deer of All Lands' (London 1898); 'Great and Small Game of Europe, Asia and Africa' (London 1901); Bryden, 'Great and Small Game of Africa' (London 1899); Sclater and Thomas, 'Book of Antelopes' (London 1894–1900); Caton, 'Antelope and Deer of America' (Boston 1881); Marsh, 'Dinocerata' (Washington 1884); Cope, 'Organic Evolution' (Chicago (1896); Osborn, 'Age of Mammals' (New York 1910).

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UNICORN, a fabulous animal, described in ancient accounts as a native of India, with the body of a horse but of larger size, and with one horn of one and one-half to two cubits in length on its forehead, perfectly straight, with a white base, black middle and red tip. The unicorn was adopted as a supporter of the royal Scottish arms, from which it has been introduced as the left supporter of the British arms, and has in this form been imported into India. Consult Brown, Robert, 'The Unicorn' (London 1881) and Gould, Charles, 'Mythical Monsters' (ib. 1886).

UNICORN-FISH. See File-fishes.

UNICORN PLANT, one of the popular names of plants of the genus *Martynia*, glandular, pubescent and fetid herbs, natives of America. They have irregular funnel form corollas, with oblique tubes, and limbs which are slightly two-lipped. The flowers are velvety, yellowish-white and purple-mottled, and borne in racemes on a decumbent stem possibly two feet long in the devil's horns (*M. louisiana*), common in the southwestern United States, and occasionally escaped from gardens. The leaves vary from ovate to orbicular, sometimes undulate at the edges, and the fruits are four-celled, four to five inches long, oblong, and prolonged into a curved point much longer than the body. At maturity the rather fleshy outer green layer of the fruit disappears, and leaves the woody part of the pods, which ultimately splits into two valves, that are very tough and black, and sometimes as much as 13 inches long. These tapering horns are moistened and split by the Indian women of the Southwest, who weave them into their baskets, as the black element necessary in their color-scheme of decoration. The plant itself often serves as a motif for the design.

UNICORN-ROOT, a graceful smooth plant (*Chamælirium luteum*) of the bunch-flower family. It has a tuft of radical spatulate foliage and narrow stem-leaves. The flowers are

small and white, with a perianth of six segments, and are dicœcious, in long racemes. The staminate racemes, nodding at first, eventually stand straight; fertile ones are always erect. The fertile plants are sometimes three feet high. The tuberous rootstocks are bitter, and an infusion of them is a popular tonic and anthelmintic, and is said to be a large ingredient of certain patent medicines. One of the industries of the mountaineers of the southern Alleghanies is that of digging these roots. This *Chamælirium* is also known as devil's bit, or blazing star. The latter name being more generally and correctly applied to the stargrass (*Aletris farinosa*), which is a similar plant, having a bitter tuberous rhizome.

UNIFORMITARIANISM, Huxley's name for the Lyellian doctrine of uniformity of geologic processes and results in all ages of the earth's history. In other words this doctrine teaches that the forces operative upon and within the earth to-day were active in former geologic times, and produced the same results, and to them alone are due the structural features of the earth and not to catastrophic revolutions. See HUTTONIAN THEORY.

UNIFORMITY, Act of, in English Church history, the acts 13 and 14 Charles II, designed to regulate the terms of membership in the Church of England and in the colleges of the universities of Oxford and Cambridge. Both the Anglican (or Episcopal) and the Presbyterian parties had desired that their respective belief should be that of the established church, and Charles Stuart, who, as a step toward obtaining his father's throne, wished to stand well with both parties, promised, while still in exile at Breda, to use his influence to bring about a certain measure of comprehension. But the Parliament, which was overwhelmingly Anglican, was in no mood to favor such a scheme, and the Act of Uniformity which was passed required the clergy to sign the Thirty-nine Articles and to use the Book of Common Prayer. The enforcement of these regulations wrought the exclusion or the secession from the established church of 2,000 ministers and laid the foundation of modern dissent. Among the provisions of the Act of Uniformity was one which made actual receiving of the communion of the Anglican Church a condition precedent to the holding of public offices; this condition was abolished by the act 9 George IV, ch. 17; and in 1829 the Test Act of 1672, a supplement to the Uniformity Act, was repealed; that act excluded Roman Catholics from public offices. In 1871 the University Tests Act abolished subscription to the articles, all declarations or oaths respecting religious belief, and all compulsory attendance at public worship in the universities.

UNIFORMS, Military and Naval, special costumes used in an army or a navy. While badges of identification have been known at all epochs, and while the followers of a lord often wore the livery of their master, the use of a uniform costume by large bodies of men was unknown until the modern era of large standing armies. The first advance beyond temporary badges was the use of a colored scarf to identify the various brigades of the Swedish army under Gustavus Adolphus. This device spread rapidly. The danger of the use of such simple devices by an enemy soon led — first in France and soon after in England — to the adoption of a more or less definite uniform. The "New Model" of Cromwell was clothed in a costume essentially that of the civilians of its time but of the uniform color of red with gray breeches and with special regimental facings. The armor which was originally worn over the uniform disappeared throughout Europe early in the 18th century and the use of the uniform was established to about the same extent as it prevails to-dav.

The military costume, like the civil, changed little in general outlines till the end of the 18th century. The original broad-brimmed felt hat was modified into the cocked hat, the breeches and coat lost their original fullness and the uniform became what is familiar to us in pictures of the American Revolution. Garments apparently less adapted than those of the middle of the 18th century to the active business of fighting can scarcely be imagined, yet after all they were in precise accord with the stiff, formal, drill-master-like spirit of the close-order fighting of the day. The stock and collar came into use and much that previously played a useful part in the uniform — cuffs, lapels, etc. — was reduced to a dummy form which served for ornament alone. Various forms of headgear worn by irregular troops from eastern Europe became stiffened and formalized into shapes which partly ousted the cocked hat, and are even yet in use. Among these were the busby, the fur grenadier cap and the mitre-cap of the Prussians, all descended from a conical cap edged with fur; the stiff leather shako — which has given rise to most of the military headgear of the world to-day — and the square-topped czapka or lancer cap, which has shrunk from a crude leather cap to a complicated device mimicking to a greater or less extent the German pickelhaube.

Toward the end of the 18th century the ample tailed coat began to shrink into the coatee, of a size scarcely greater than that of the tunic or blouse of the present day. This made necessary the introduction of a new article of military apparel — the overcoat. The breeches and white gaiters followed tardily in the suit of the civilian clothing of the time and were replaced by trousers in the first quarter of the 19th century. The helmet was also introduced at about this period, and is at present retained by the dragoons of most armies and by the German infantry.

The period after Waterloo was distinguished even above the 18th century for the extreme uncomfortableness of the uniforms and their total unfitness for any activity whatever. This was swept away in England by the reaction due to the Crimean War. At about the same time or a little earlier the coatee gave way to the looser tunic. The dress uniforms of to-day date back in essentials to this epoch. The dull service uniforms worn by all armies in the field at the present time are designed for comfort, usefulness and inconspicuousness and date back to the border warfare in India during the latter half of the 19th century. Their general use is due to the experiences of the British in the Boer War. America soon followed the British khaki with its olive drab. Germany adopted a greenish gray, Italy a bluish gray and Russia a

grayish green. The Belgian khaki and the French horizon blue were only introduced after the unsuitability of the old brilliant uniforms had been manifested in the first months of the European War. The steel helmets in general use at present were introduced a little later.

The enlisted man in the United States army has a khaki or olive-drab service uniform, a blue dress uniform, a fatigue uniform of blue denim and in some cases a white uniform. The facings of the dress uniform and the hat-cord of the service hat are of the corps color, which are blue for the infantry, yellow for the cavalry, red for the artillery, red and white for the engineers, orange and white for the signal corps, maroon and white for the medical corps, straw-color for the quartermaster corps, red and black for the ordnance corps and green for the service school detachments. The officers' uniforms, besides service, dress and white uniforms much like those of the enlisted men, are the full dress, the special evening dress and the mess jackets, worn on special occasions. The history of the uniforms of the United States army lends itself into a division into periods separated by the various wars in which the United States has taken a part. During the American Revolution the uniforms were governed by no particular principle, if the troops were so lucky as to be uniformed at all. After the end of the Revolution, the French uniforms were taken as a pattern and blue was made the color of the infantry and artillery uniforms, which were faced with white. Soon afterward, when cavalry regiments were raised, they were similarly uniformed, first in green with white facings and then in green with black facings. These uniforms survived in a more or less modified form until the War of 1812 when the sudden influx of large numbers of variously equipped militia made the re-establishment of a definite uniform desirable. The French model was again adopted, with dark-blue coatees and white or light-blue breeches or trousers. From the Mexican War to the beginning of the Civil War the uniform consisted of a long coat and trousers, with a shako or slouch hat. The corps colors were adopted at this period, in a form not widely divergent from that of the present day. The Civil War universalized the service or undress uniform of blue, light in the coat and dark in the trousers. This again mimicked the uniform of the French, but after 1870 the success of the Germans caused the cut of the uniforms and the spiked helmets to be modeled after those of the Germans. For service the slouch hat and leggings were worn. The uniform was found to be unsuited for active service in the Spanish War and was replaced by one of khaki. After the war this color was retained for the service uniform, which was patterned after that of the British. The dress uniform retains the original blue color.

The British dress uniforms are perhaps the most varied and gorgeous of those of any country in the world. Their general color is red, though certain rifle regiments, etc., form exceptions. They are faced with the color of the regiment. The khaki field-service uniforms much resemble those of the United States, except for the pleated pockets and the collar, which is box-cut for the officers and turns over in the uniforms of the enlisted men. Rolled leggings known as puttees are used. While this uniform is practically the same throughout the army, the Highland Scotch regiments retain their tartan kilts, though they cover these with a khaki apron. The present field-service uniform dates back to the Boer War of 1899–1902.

Blue coats and red trousers make up the dress uniform of most French soldiers and before the European War were worn on active service. The long coat of the infantryman with its bottom corners buttoned back is characteristically French. The European War has caused the French uniform — particularly that of the officers — to be assimilated to that of the British. The color, however, is light blue.

The Italian infantryman wears a dark blue tunic, gray trousers and a cloth shako. In the cavalry the trousers are replaced by breeches and the shako by a busby in lancer regiments and a helmet in dragoons. The Bersaglieri wear a broad-brimmed felt hat with a plume of cock's feathers. The service uniform is brownish gray.

Before the collapse of Russia in 1917 the uniform was in general green in color and in the infantry consisted of a large peaked cap, a loose blouse, trousers and high boots. The facings varied with the regiments. The cavalry wore blue or green coats with gray breeches. Cossack and Siberian regiments wore high sheep-skin caps. The field service uniform was of a khaki color.

The general color of the German dress infantry tunics is Prussian blue, except in Bavaria, where it is light blue. The trousers are black and the facings vary with the different regiments. The head-dress on some occasions is a brimmed or brimless cap, on others a spiked helmet. The tunics of rifle regiments are green and they wear shakos. Cuirassiers wear metal helmets and white tunics. The tunics of uhlans and dragoons are blue and their helmets are made of leather. The several regiments of hussars wear helmets of different colors and their head-dress is a busby of brown fur. Engineer and artillery uniforms are entirely blue. The field uniform is a brownish gray. The ordinary head-dress is retained but covered by a gray cover. The Austrian tunic is generally dark blue, except that rifle regiments and engineers wear gray, while the artillery wears brown. The infantry wears light blue trousers, except in rifle regiments, where gray trousers are worn. Gray trousers are also worn by engineers. Mounted troops wear red breeches. The infantry head-dress is a shako. Hungarian uniforms are patterned after the Austrian with the exception that elaborate braiding is used on the trousers. The field-service color of Austria-Hungary is bluish gray and a special gray cap is worn, except in cavalry regiments, which use their ordinary head-dress, protected by a gray cover.

Other countries incline as a rule either to the German or the French model of uniform. The French influence preponderates in Switzerland, Holland, Belgium, Spain, Portugal, Rumania, Greece, Brazil and Argentina. The uniforms of the Scandinavian countries, Turkey and Chile are German in cut, Serbia combines French and Austrian influence, while the uniforms of Bulgaria are distinctly Russian. The British influence is preponderant in many field-service uniforms, such as those of China, Japan,

Greece and the United States. China and Mexico have borrowed to some extent from the United States, while the Cuban uniforms resemble the American ones very closely.

Naval uniforms are much the same throughout the world. The British naval uniform, after which all others have been patterned, consists for the men of a jumper or overshirt of the familiar navy pattern, bell-shaped trousers and a "pancake" cap, with a ribbon indicating the ship to which its bearer belongs. The blue undress or service uniform of the British officer consists of a peaked cap, a double-breasted coat with brass buttons and blue serge trousers. There are various mess and dress uniforms. The American uniforms closely resemble the British, except that in the officers' blue service dress a braid-trimmed blouse is worn instead of a coat. The Russian sailors wear a military tunic when on shore duty. In the German navy the cap-ribbons are very long and a jacket with many buttons is worn over the overshirt. (For the insignia of rank in the various armies and navies of the world, see MILITARY INSIGNIA OF RANK). Consult the publications of the War and Navy Departments of the various governments and Detaille, 'L'Armée française' (Paris 1889); id., 'Catalogue illustré de l'exposition rétrospective militaire du ministière de la guerre' (ib. 1890); Farmer, J. S., 'Regimental Records' (London); Knotel, R., 'Handbuch der Uniformenkunde' (Leipzig 1896); Lienhardt and Humbert, 'Les uniformes de l'armée française'; Ogden, H. A., 'Uniforms of the Army of the United States, 1779–1888' (Washington 1908).

UNIGENITUS, ū-nĭ-jĕn'ĭ-tŭs, the bull (1713) of Clement XI by which 101 theological propositions of a Jansenistic tenor contained in the writings of Pasquier Quesnel are condemned as heretical, scandalous, impious, etc. (See QUESNEL; JANSENISM). The title of the bull is derived from its opening words *Unigenitus Dei Filius*. Among the doctrines alleged to be contained in Quesnel's writings ('Moral Reflexions' on the Gospels and the whole New Testament) is this, that all love except the supernatural love of God is evil; that without this supernatural love there can be no true hope, observance of the law or religion; that every prayer made by a sinner is itself sinful; and that the Church is made up of the elect alone. While Louis XIV lived he compelled obedience to the bull; but after his death, 1717, and the succession of his great-grandson, Louis XV, under a regency, those ecclesiastics who were opposed to the Roman decisions, among them Noailles, archbishop of Paris, and four other bishops, made appeal to a future council of the Church against the Pope. Another appeal was made "from the pope ill informed to the pope better informed"; but the popes who succeeded Clement XI down to 1730, namely, Innocent XIII, Benedict XIII and Clement XII, would not entertain the appeal; the assembly of the French clergy in 1723 petitioned the king to uphold the Unigenitus with all the power of the state; in 1727 one of the appellants, Soanen, bishop of Séez, was condemned by a provincial church council and was banished by the government; even Noailles in 1728 went over to the side of the Ultramontanes, and in 1730 the Sorbonne formally accepted the bull; the same year the parliament of Paris was compelled to register it.

UNIMAK, oo-nĭ-mäk', an island of Alaska, the largest of the Aleutian Islands, about 75 miles long and 25 miles wide. A lagoon called Isanotski, of False Pass, separates the island from the mainland of the Peninsula of Alaska. Like the adjacent islands, it is volcanic. Shishaldin, an active volcano, is about 9,000 feet high. Sulphur abounds on the slopes and base, in crevices, of Shishaldin and near Progrumnoi volcano (5,523 feet high), in the western part of the island. The island is rocky and almost destitute of trees. The villages are few and small. The population is made up of Aleuts.

UNION, ū'nyŏn, Me., town in Knox County, on the Georges Valley Railroad, a short line which extends from Warren to Union. The town contains the villages of Union, South Union, North Union and East Union. It was settled in 1744 and was first called Taylor Town. In 1786 it was organized as the Plantation of Sterlington, but the same year it was incorporated and took the name Union. In 1811 a part of the town was set off and called the town of Washington. The chief manufacturing establishments are mowing-machine works, machine shops, carriage and furniture factories and organ works. Stoves are made here and considerable attention given to farm and dairy products. Pop. 1,233.

UNION, La, lä oo-nē-ōn', Philippines, a province of the island of Luzon, in the southwestern part of northern Luzon, bordering on the China Sea; bounded on the north by Ilocos Sur, on the east by Lepanto and Benguet and on the south by Pangasinán; length, north and south, 51 miles; greatest width, 31 miles in the north, narrowing to 10 miles in the south; area, 867 square miles. The province is mountainous in the east, the western mountain sides sloping abruptly to the coast plains. There are numerous small rivers. The soil is well cultivated; tobacco, rice, corn, cotton, sugar and chocolate are the principal products; large quantities of sibucao, a valuable dye plant, grow on the mountains. Livestock raising is one of the principal industries of the province; carabaos and cattle, horses and hogs are raised. The west coast road of Luzon traverses this province; this is paralleled by a telegraph line and also the Manila and Dagupan Railroad; there are no roads, however, which extend any distance into the interior. Civil government was established in August 1901; and at the close of that year the provincial governor reported the province in a peaceful and prosperous condition. Pop. 138,000, mostly Igorots and Ilocanos.

UNION, La, Salvador, a seaport and capital of the department of the same name, at the base of the Conchagua volcano, rising from the west shore of Union Bay, a landlocked inlet of the Gulf of Fonseca. An active domestic and coasting trade is carried on. Pop. 5,300.

UNION CHRISTIAN COLLEGE, located at Merom, Ind. It was chartered in 1859 under the auspices of the Christian Church and opened to students in 1860; the government of the college is vested in a board of 15 trustees elected by the stockholders from nominations made by the Church conferences of Illinois, Indiana and Ohio. The college has, in addition

to the regular collegiate departments of instruction, a Biblical Department, a Normal Department, a Department ot Music, a Preparatory Department and special courses in elocution and physical culture. There are two collegiate courses, the classical and scientific leading to the degrees of A.B. and B.S. respectively; a limited number of electives are offered in each course; and a thesis is required for the obtaining of a degree. The degrees of A.M. and M.S. are conferred for graduate work. The Biblical Department and the Normal Department both offer three years' courses. The college is open to men and women on equal terms. The students maintain two literary societies. In 1901 an offer of $30,000 for the endowment was received from F. A. Palmer of New York, on condition that the college raise $20,000. The condition was met by 1902, and thus $50,000 added to the endowment fund. The students number about 200 and the faculty 11.

UNION CITY, Ind., city, Randolph County, on the Pittsburgh and the Cleveland, Cincinnati, Chicago and Saint Louis railroads, about 80 miles northeast of Indianapolis, and 32 miles east of Muncie. It is near the Ohio boundary Union City is in an agricultural and stock-raising region; and the forests contain valuable hard woods, as ash, oak, hickory, walnut and chestnut. The chief manufacturing establishments are flour mills, creameries, furniture factories, automobile factories, wheel and carriage works and machine shops. There are a high school, public and parish schools, hospital and a public library. Pop. 3,209.

UNION CITY, Mich., village in Branch County, on the Saint Joseph River, and on the Michigan Central Railroad, about 55 miles southwest of Lansing and 28 miles southeast of Kalamazoo. It is in a fertile agricultural region. The chief manufacturing establishments are a flour mill, creameries, a machine shop and lumber mills. It ships a considerable amount of farm and dairy products and fruit. Pop. 1,340.

UNION CITY, Pa., borough in Erie County, on the Pennsylvania and the Erie railroads, about 25 miles southeast of Erie. It is in an agricultural and oil region. The chief industrial establishments are flour mills, barrel factories, planing and grist mills, a powdered-milk plant, wagon and carriage works, furniture factories, oil-refinery, a tannery and a pump factory. Cabinet ware and dairy products are among the shipments to outside markets. The educational institutions are a high school, public and parish elementary schools, a business college, and a public library. Pop. 3,684.

UNION CITY, Tenn., town, county-seat of Obion County, on the Nashville, Chattanooga and Saint Louis and the Mobile and Ohio railroads, about six miles from the Kentucky border and 110 miles northeast of Memphis. It is an agricultural and stock-raising region and nearby are extensive timber lands. The chief manufacturing establishments are lumber mills, ice factories, canneries, furniture works, cotton mills, spoke factories and machine shops. The principal products shipped to other markets are farm and dairy products, fruit, cotton and lumber products. The educational institutions are Union City High School and Training School, public elementary schools for white and for colored pupils and a school library. Nailling Hospital is located in Union City. Pop. 4,389.

UNION COLLEGE, located at College View, a suburb of Lincoln, Neb. It is a part of the school system of the Seventh-day Adventists; the site was chosen in 1890, and the college opened to students in 1891. It is avowedly denominational and observes the Sabbath on the seventh day (Saturday). It is open to both men and women. It offers two regular college courses leading to degrees, the literary and scientific, and confers the degrees of A.B. and B.S. A limited amount of elective work in advanced courses is allowed in the senior year. There is also an academic course of four years, and a number of special courses, including the ministerial course (three years), the advanced normal course (three years), the elementary normal course, preparatory medical course, preparatory nurses' course, commercial course, phonography course and a German Biblical and a Scandinavian course, the two last mentioned being especially designed to train missionary workers among Germans and Scandinavians. Instruction is also given in music and art. In 1902 it was decided that manual training should be required of every student. Instruction and practice work are given in printing, broommaking, carpentering, blacksmithing, metal working, electrical work, tailoring, sewing and cooking. *The Central Advance* (a denominational paper), a German and a Scandinavian paper are printed at the college shop. The campus consists of 22 acres on elevated ground; the chief buildings are the main building and the dormitories or "homes." The library contains over 6,000 volumes; the students in all courses number about 550, with a faculty averaging 25 members.

UNION COLLEGE, located at Schenectady, N. Y. See UNION UNIVERSITY.

UNION FLAG, or **UNION JACK,** the national flag of Great Britain and Ireland, is a composite of the prominent features of the flags of England, Scotland and Ireland. The first union flag was made upon the accession of James I, and from the fact that that sovereign signed himself "Jacques" the flag has been improperly nicknamed the Union Jack (a "jack" properly being a flag flown upon the jack-staff of a ship). The first national flag in 1606 combined the English banner of Saint George (argent, a cross gules) with the Scottish banner of Saint Andrew (azure, a saltire argent). In 1707 the flag was revised, becoming in heraldic terms azure, a saltire argent surmounted by a cross gules fimbriated of the second. When Ireland was united with the kingdom of Great Britain the flag was again altered, the red cross of Saint Patrick being introduced and forming the present Union Jack. In heraldic terms it is: azure, the crosses saltires of Saint Andrew and Saint Patrick quarterly per saltire counterchanged argent and gules, the latter fimbriated of the second, surmounted by the cross of Saint George of the third fimbriated as a saltire. This was first hoisted on the Tower of London 1 Jan. 1801. The flag is the national flag for use on shore and for land forces; it is used at sea only on a

ship bearing the English sovereign, when it is hoisted at the main mast, and at the main mast of the flag-ship of a fleet commanded by an admiral. With a harp on a blue shield displayed in the centre it is the flag of the lord-lieutenant of Ireland. With the star and device of the order of the Star of India it is flown by the governor-general of India. When this flag design occupies the upper corner next to the staff of a red, white or blue field the flag so formed is called the red, white or blue ensign and is the flag for use on shipboard. Merchantmen carry the red ensign, and all British war vessels carry the white ensign divided into four quarters by the cross of Saint George. See FLAGS OF FOREIGN NATIONS.

In the United States the term «Union Jack» is applied to the blue flag with white five-pointed stars (one for each State in the Union), used in the navy. The flag is usually displayed when the vessel is in port.

UNION LABEL, a trade-mark adopted by a trades union to be placed on articles manufactured wholly in union shops, under union rules by their sanction. The union label originated in 1896 with the cigarmakers of San Francisco in their conflict with Chinese labor. Since then its application has spread till all trades-unionism looks to it as one of the most successful means of waging the struggle with combined capital. By agreement with individual manufacturers the labels, copyrighted by the unions, are attached to the various products of factory and mill, each box of cigars, for instance, each newspaper, each garment, and so on. While many unions have their copyrighted labels, a large number employ the common label of the American Federation. Many States have passed laws imposing penalties upon counterfeiters of labels, and upon users of counterfeit labels. See AMERICAN LABOR; LABOR; UNIONISM, etc.

UNION LEAGUE OF AMERICA, The, began in 1862 in order to check the spread of disaffection to the United States government and to «make loyalty effective.» The movement was spontaneous; the members of the United States Sanitary Commission began the organization in 1862, in Ohio, Philadelphia and New York. Leagues were formed all over the North before the end of 1863. The members were pledged to repudiate any political belief that conflicted with unconditional loyalty to the Union. Several similar orders were absorbed by the Union League. The organization distributed more than 5,000,000 political pamphlets; recruited negro regiments; sent teachers to instruct the negroes and demanded negro suffrage in 1865. The league was gradually extended into the South among the «Unionists,» and during 1865–66 had a strong membership of whites in the mountain districts of that section. In 1867 negroes were admitted to the order in the South and at once nearly all of the whites deserted. From 1867 to 1876 the league and its offshoots formed the «machine» of the Radical party in the South. It controlled the negro vote absolutely and organized it well; it made all nominations for office, and severely disciplined those who disobeyed orders. A constitution and ritual were adopted for use in the South. There was a weird initiation ceremony to impress the negroes. The members swore to vote for no one except members of their own order. An ex-Confederate could not join unless he would acknowledge that his course during the war had been treason, and under no circumstances was he eligible to office in the order or to become a candidate for political office. The administration of the league was in the hands of the so-called carpet-baggers or political adventurers from the North. The local assemblies were called councils; these together formed the Union League of America, with headquarters in each Southern State and general headquarters in New York. In the councils the negroes were drilled in the faith of the Republican party, a catechism being prepared for that purpose. There was complaint that the league was a cause of disorder and violence among the blacks on account of its incendiary teachings. At one time it was said that the membership reached 500,000 in the South. In the North after 1865 the order gradually died out, the surviving leagues becoming social clubs, the chief of which is the Union League Club of New York City, incorporated 16 Feb. 1865. It has had a great influence on Republican politics and of late years has opposed the progressive members of that party. By many it is considered one of the greatest strongholds of conservatism and reaction in America. As an institution of Reconstruction the Union League was most important. The rigid organization and the strict control imposed by it upon the blacks made it possible for them to vote as a race and vote the Republican ticket. Without the admirable discipline of the order, the few leaders of the Radical party in the South would have been unable to prevent the Conservative or Democratic party from controlling the votes of the negroes, thus preventing the objects of the Reconstruction.

UNION LEAGUE CLUB, The, a social and political club organized, in 1863, in New York, by members of the local Republican party. It was incorporated in 1865, its avowed object being «to promote, encourage, and sustain by all proper means, absolute and unqualified loyalty to the government of the United States; to discountenance and rebuke, by moral and social influences, all disloyalty to said government and every attempt against integrity of the nation»; and also to establish a library and art gallery for the collection of literature and works of art, and military trophies relating to the war. The club has a membership of about 1,800, and its headquarters are at its palatial clubhouse, 39th street and Fifth avenue, New York City.

UNION PACIFIC SYSTEM. The Union Pacific Railroad was organized 1 July 1897, under an act of the legislature of Utah approved 22 Jan. 1897, «to carry out the reorganization of the Union Pacific Railway Company,» and now includes the Union Pacific Railroad, the Oregon Short Line and the Oregon Railroad and Navigation Company. The northerly or main line runs westward from Council Bluffs (Omaha) across the central part of the State of Nebraska, a co-ordinate line running almost parallel, about 150 miles to the south from Kansas City across the State of Kansas, and to Denver, Colo., whence it trends northward, joining the main line at Cheyenne, Wyo. Thence the

road continues westerly across the southern section of Wyoming and to Ogden, Utah. From this point the system makes use of its subsidiary, the Oregon Short Line, traversing southern and western Idaho, to Huntington, Ore.; and thence by the subsidiary Oregon-Washington Railroad and Navigation Company's road to Portland, Ore., and Seattle, Wash.

The total mileage operated, as of 31 Dec. 1917, was 7,714.97 miles, of which 3,597.80 is of the Union Pacific Railroad, 2,148.65 of the Oregon Short Line, and 1,968.52 of the Oregon-Washington Railroad and Navigation Company. The system is prolific of branches, the main lines covering 3,534.64 miles, and the branches, 4,180.33 miles. Besides these roads there is operated 302.22 miles of leased lines, and the company enjoys trackage rights over 254.30 miles of other railroads.

The total operating revenue for the calendar year 1917 amounted to $130,101,864; earned by the transportation of 9,315,764 passengers and 23,874,511 tons of freight. The passenger travel averaged 115.08 miles per trip, at a cost of the traveler of 2.326 cents per mile — aggregating in the year 1,072,053,665 miles and $25,207,229. The freight haul average 448.3 miles per ton, at an average charge of 0.851 cent per mile — aggregating in the year 10,702,976,670 ton-miles and $93,347,832.

The operating expenses for the year were $77,295,158, making the net operating revenue $52,806,706. Taxes amounted to $8,451,691, leaving the net operating income at $44,355,015. Non-operating income amounted to $13,170,361 and deductions for rentals, interest, etc., totaled $15,998,875, leaving the net income at $41,536,500.

Dividends to preferred stock amounted to $3,981,740, and to common stock (16.89 per cent), $22,229,160. The sum of $15,313,973 was appropriated for the road and equipment.

The equipment of the road on 31 Dec. 1917 consisted of 1,538 locomotives, with an aggregate tractive capacity of 52,714,182 pounds. Passenger coaches, mail and baggage cars numbered 1,150, of which 574 were of steel. Freight cars of all types numbered 41,247.

The entire investment in the road and its equipment on 31 Dec. 1917 stood at $632,813,457. Investments in other companies totaled $268,733,986.

The total stock outstanding on the date cited amounted to $321,836,600 and the long term debt was $335,099,365. The credit balance of the profit-and-loss account was $124,354,104. The grand total of the system's resources was $921,273,292.

In addition to operating the railroad, the company operates four steamer lines: (1) Portland to Astoria, Ore., 98 miles; (2) Astoria to Megler, Wash., 5 miles; (3) Riparia, Ore., to Lewiston, Idaho, 78 miles; and (4) Amwaco to Harrison, Idaho, 6 miles.

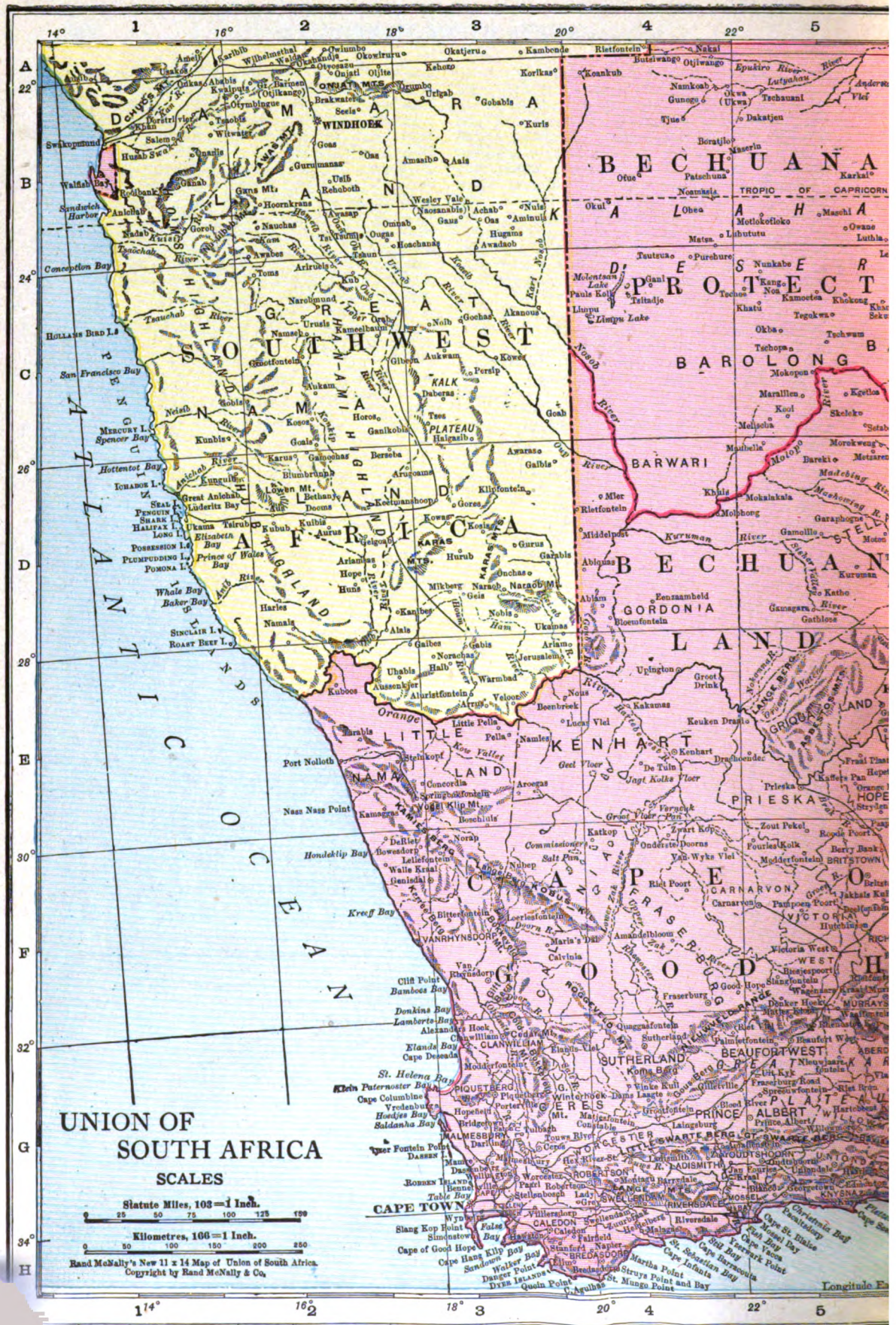
History of the Road.— The Union Pacific Railroad Company was formed "for the purpose of acquiring, constructing, and owning railroads in the State of Utah, and elsewhere, with specific authority to acquire the railroads, properties, franchises and land grants formerly belonging to the Union Pacific Railway Company." That corporation owned four divisions of railroad, with a total length of lines of 8,172 miles. In 1893, receivers were appointed for all lines except those owned jointly with other companies. Afterward, separate receivers were appointed for some of the controlled roads.

When the Union Pacific Railway Company was first placed in the hands of receivers, the bonds outstanding aggregated $78,470,000. In addition to this amount, the government subsidy bonds amounted to $33,540,000. On this latter amount, the unpaid interest was $18,194,000. At that time the share capital of the company aggregated $60,869,000. A short time after the receivers had taken possession of the property, legislation to guarantee a Federal government lien at 3 per cent was proposed in Congress. The security holders at the same time put forward a reorganization method. Both plans were defeated.

In 1897 the main line, from Council Bluffs to a point five miles west of Ogden, Utah, a distance of 1,048 miles, together with 70 per cent of the equipment, was sold under foreclosure and purchased by the reorganization committee, which, later, borrowed $44,000,000 from a syndicate. Following this event many extensions were made. In 1899 control was acquired of the Oregon Short Line Railroad. This purchase was followed by that of the Oregon Railroad and Navigation Company property. In 1901 by purchase of a controlling interest, possession was gained of the Southern Pacific Railroad Company and, three months later, control of the Northern Pacific Railroad Company was acquired. These interests it was afterward compelled to relinquish as in contravention of the anti-trust law. The Union Pacific has important connections with Southern California points by virtue of its affiliation with the Los Angeles and Salt Lake Railroad.

UNION OF SOUTH AFRICA, a legislative union of the four self-governing colonies of South Africa, effected by the South Africa act, which was promulgated by royal proclamation of Great Britain 20 Sept. 1909, and became effective 31 May 1910. The original provinces of the union were Cape of Good Hope, Natal, Transvaal and Orange Free State. United they are bounded on the north by the former colony of German Southwest Africa, Bechuanaland Protectorate, Matabeleland and Portuguese East Africa, on the east by the Indian Ocean, on the south by the Atlantic Ocean and on the west by the Atlantic Ocean and the former colony of German Southwest Africa.

The area of the Union is 473,075 square miles, distributed as follows: Cape Colony, 276,966 square miles; Natal, 35,290 square miles; Transvaal, 110,430 square miles; and Orange Free State, 50,389 square miles. The total population of the Union is 5,973,394 (1,276,242 Europeans), distributed as follows: Cape Colony, 2,564,965; Natal, 1,194,643; Transvaal, 1,686,212; Orange Free State, 528,714. The capitals of the four provinces composing the Union are Cape Town (Cape Colony), Pietermaritzburg (Natal), Pretoria (Transvaal), and Bloemfontein (Orange Free State). The principal cities, with populations, are: Johannesburg (119,953), Durban (31,783), Cape Town (29,863), Pretoria (29,611), Pietermaritzburg (14,737), and Bloemfontein (14,730). The total imports for 1916 were valued at $188,622,000, and exports $104,237,000, the United States being credited with 15.7 of the former and 14.8 of the latter. The public debt of the Union ex-


UNION OF SOUTH AFRICA
SCALES
Statute Miles, 103 = 1 Inch.
0 25 50 75 100 125 150
Kilometres, 166 = 1 Inch.
0 50 100 150 200 250
Rand McNally's New 11 x 14 Map of Union of South Africa.
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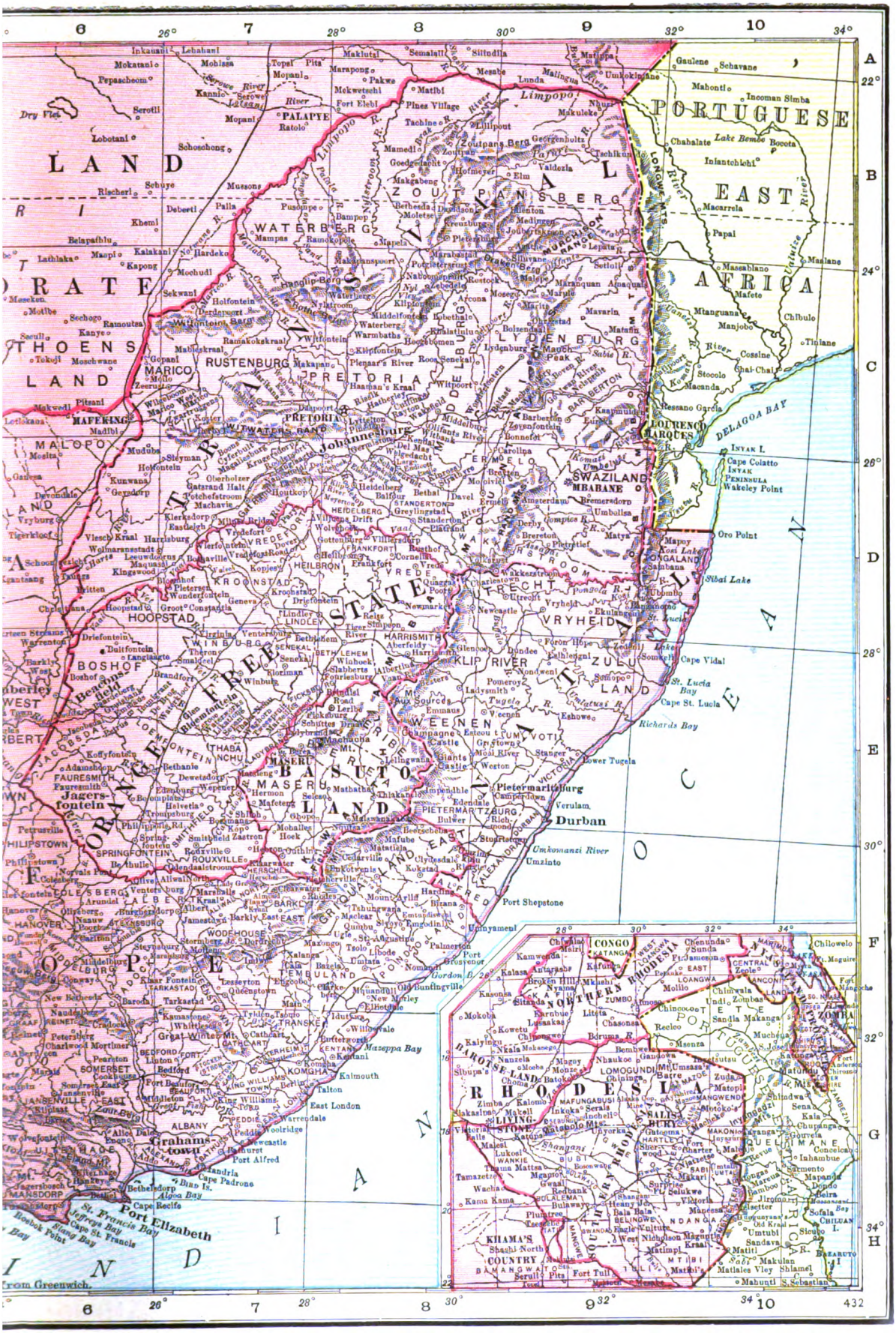
BECHUANA
PROTECT
BAROLONG
BARWARI
BECHUANA
LAND
GORDONIA
KENHART
LITTLE NAMA LAND
CAPE GOOD HOPE
SOUTHWEST AFRICA
GREAT NAMA LAND
DAMARA LAND
KALAHARI DESERT
ATLANTIC OCEAN
CAPE TOWN
WINDHOEK
TROPIC OF CAPRICORN
Longitude East


PORTUGUESE EAST AFRICA
RHODESIA
NORTHERN RHODESIA
SOUTHERN RHODESIA
BECHUANALAND
BASUTO LAND
SWAZILAND
ORANGE FREE STATE
TRANSVAAL
NATAL
ZULU LAND
CAPE COLONY
LOURENCO MARQUES
DELAGOA BAY
Durban
Pietermaritzburg
Johannesburg
PRETORIA
KIMBERLEY
BLOEMFONTEIN
Port Elizabeth
East London
Grahamstown
Kimberley
Bulawayo
Salisbury
Beira
Umtali
Fort Victoria
Gwelo
Lake Bemba
Lake Shirwa
Lake Chiuta
Lake Nyasa
Limpopo R.
Zambesi R.
Shire R.
Pungwe R.
Buzi R.
Sabi R.
Umzimvubu R.
Umtamvuna R.
Umkomaas R.
Umgeni R.
Tugela R.
Umfolozi R.
Umhlatuzi R.
Umzimkulu R.
Umtata R.
Kei R.
Great Fish R.
Orange R.
Vaal R.
Caledon R.
Modder R.
Molopo R.
Kuruman R.
Hex R.
Olifants R.
Crocodile R.
Komati R.
Usutu R.
Pongola R.
Buffalo R.
Tugela R.
Umzinto
Umkomaas
Port Shepstone
Richards Bay
St. Lucia Bay
Cape St. Lucia
Cape Vidal
Delagoa Bay
Lourenco Marques
Inyak I.
Cape Colatto
Inyak Peninsula
Wakeley Point
Oro Point
Sibai Lake
Lake Sibaya
Lake Chrissie
Lake Banagher
Lake Sumeni
Lake Fundudzi
Lake Ngami
Lake Dow
Lake Kariba
Lake Mweru
Lake Bangweulu
Lake Tanganyika
Lake Nyasa
Lake Chiuta
Lake Shirwa
Victoria Falls
Kariba Gorge
Cape Recife
Algoa Bay
Port Alfred
Cape Padrone
Bird I.
Jeffrey Bay
St. Francis Bay
Cape St. Francis
Port Nolloth
Walvis Bay
Swakopmund
Luderitz
Orange River Mouth
Port Nolloth
Namaqualand
Great Namaqua Land
Little Namaqua Land
Damaraland
Ovamboland
Kaokoveld
Great Karroo
Little Karroo
Bushmanland
Hantam
Roggeveld
Nieuwveld
Sneeuwberg
Witteberg
Stormberg
Drakensberg
Maluti Mts.
Quathlamba Mts.
Lebombo Mts.
Inyanga Mts.
Vumba Mts.
Chimanimani Mts.
Gorongoza Mt.
Mlanje Mt.
Zomba Mt.
Kilimane
Beira
Chinde
Quelimane
Inhambane
Lourenco Marques
Durban
Pietermaritzburg
Johannesburg
Pretoria
Kimberley
Bloemfontein
Port Elizabeth
East London
Grahamstown
Bulawayo
Salisbury
Umtali
Fort Victoria
Gwelo

ceeds $756,000,000. There are 8,924 miles of railway and over 16,000 miles of telegraph line.

Provision was made by which other British colonies might join the Union. Before the day appointed for the establishment of the Union (31 May 1910), the elective members of the senate of the Union to represent the respective provinces were chosen by the two legislative houses of each colony sitting together, and within six months after the date of the establishment the first parliament was summoned. Under the enactment of the British Parliament it was provided that the new commonwealth was to be governed by a governor-general appointed by the king, an executive council appointed by the governor-general, and a Parliament of two houses, the membership of which was to be limited to persons of European descent. Ministers of state, not more than 10, administer departments. All the powers, authorities and functions which at the establishment of the Union were in any of the colonies vested in the governor or in any authority of the colony, so far as they continue in existence and are capable of being exercised, are vested in the governor-general or the governor-general in council, or in the authority exercising similar powers under the Union, except such powers and functions as are or may be expressly vested in some other authority. The command of the naval and military forces is vested in the governor-general. The seat of government is Pretoria but the legislature sits at Cape Town. A principal feature of the membership in the senate and house of assembly is the tenure of office. The first senate was made up of eight senators nominated by the governor-general in council for 10 years, and for each of the original provinces eight senators are to be elected for 10 years by the two houses of the colonial legislature sitting together. The house of assembly consists of members chosen in electoral divisions in numbers as follows: The Cape of Good Hope, 51; Natal, 17; Transvaal, 45; Orange Free State, 17. With the increase in European population the representation will increase. The house of assembly was to continue five years from the date of its first meeting unless sooner dissolved. All money bills originate in the house of assembly, but the assembly may not pass a bill for taxation or appropriation unless it has been recommended by message from the governor-general during the session.

Each separate colony has at its head an administrator, appointed by the governor-general, an executive committee of four and a provisional council of 25 members or a number equal to the number of members which the colony sends to the Parliament of the Union. The provincial committees and councils have authority to deal with local matters, such as finance, elementary education, agriculture, charity, municipal institutions, local works, roads and bridges, markets, fish and game, etc. The governor-general approves these local ordinances.

The administration of justice is by the Supreme Court of South Africa and other courts within the Union and in the provinces. The common law of the Union is the Roman-Dutch law. Prior to 1913–14 the expenses of the four provinces were entirely defrayed from grants by the Union government. Under the Financial Relations Act of 1913 certain revenues were transferred or assigned to the provinces and the grants by the Union government were limited to 50 per cent of the total normal or recurrent expenditure of the provinces. The capital expenditures of the several provinces are financed by redeemable loans from the Union government. English and Dutch are the official languages and are treated as on an equal footing. The administration of native affairs and those pertaining to Asiatics is vested in the governor-general in council.

The industrial development of South Africa will continue to be, undoubtedly, along agricultural lines. The principal product is maize and the secondary products are bacon, beef, lard and hides. Conditions induced by the World War gave a great stimulus to wheat-growing and dairying. Sheep-farming is well established and capable of being greatly extended. Another prosperous industry is ostrich farming. Cotton, mohair and sugar and tea have become important products. The cultivation of tobacco and fruit is highly productive and wine-growing is in a flourishing condition. The aim will continue to be the upbuilding of an export trade and the extension of railway facilities from the agricultural regions. The wheat crop reached 5,500,000 bushels in the years of the war, while the maize crop of 1917 was 36,000,000 bushels. Butter to the amount of 19,412,000 pounds and cheese to the amount of 4,266,000 pounds were produced in 1917. The latest live-stock census showed 5,796,949 cattle, 719,414 horses, 93,931 mules, 336,710 donkeys, 746,736 ostriches, 30,656,659 sheep, 11,762,979 goats, 1,081,600 pigs and 10,533,909 poultry. Wool exports in 1917 amounted to 117,657,142 pounds and of mohair to 3,690,828 pounds. In the same year hides and skins to the value of $13,000,000 were exported. Cotton-growing is on the increase as the plant is a good drought-resistant. The crop is now about 3,000,000 annually. Tobacco is produced to the extent of about 9,000,000 pounds annually. Cane-sugar to the extent of 115,000 tons was produced in 1917. The tea crop in the same year was 1,747,000 pounds. The main source of South African prosperity is, however, gold, coal and diamond mining. The output of diamonds in 1917 was valued at £7,713,810 and of 1916 £5,728,391, of which Cape Colony produced £4,057,928, the Transvaal, £933,643 and Orange Free State, £736,820. The gold production of the Union was valued at £38,923,921 and was almost entirely credited to the Transvaal. Coal production in 1916 totaled 2,739,665 short tons, the Transvaal and Natal leading. Cape Colony led in salt production, having more than half of the 106,303 tons mined. The latest statistics show that 340,000 persons (of all races) are engaged in mining, of which 47,000 are Europeans. Machinery, clothing, chemicals and dynamite are some of the principal imports. In 1917 3,889 vessels (overseas and coastwise) entered the ports of the Union; total tonnage 9,253,000 tons. The Colony is defended by a permanent force, coast garrison, citizen, naval volunteer and special reserves.

After the outbreak of the World War a rebellion, of which the chief leader was Christian De Wet, broke out, but it was promptly suppressed by General Botha. In addition to send-

ing contingents for service with the British forces to France and Belgium and later in East Africa and Nyassaland, 65,000 troops were raised and sent against German South-West Africa, a campaign that was brought to a successful termination in July 1915. See WAR, EUROPEAN.

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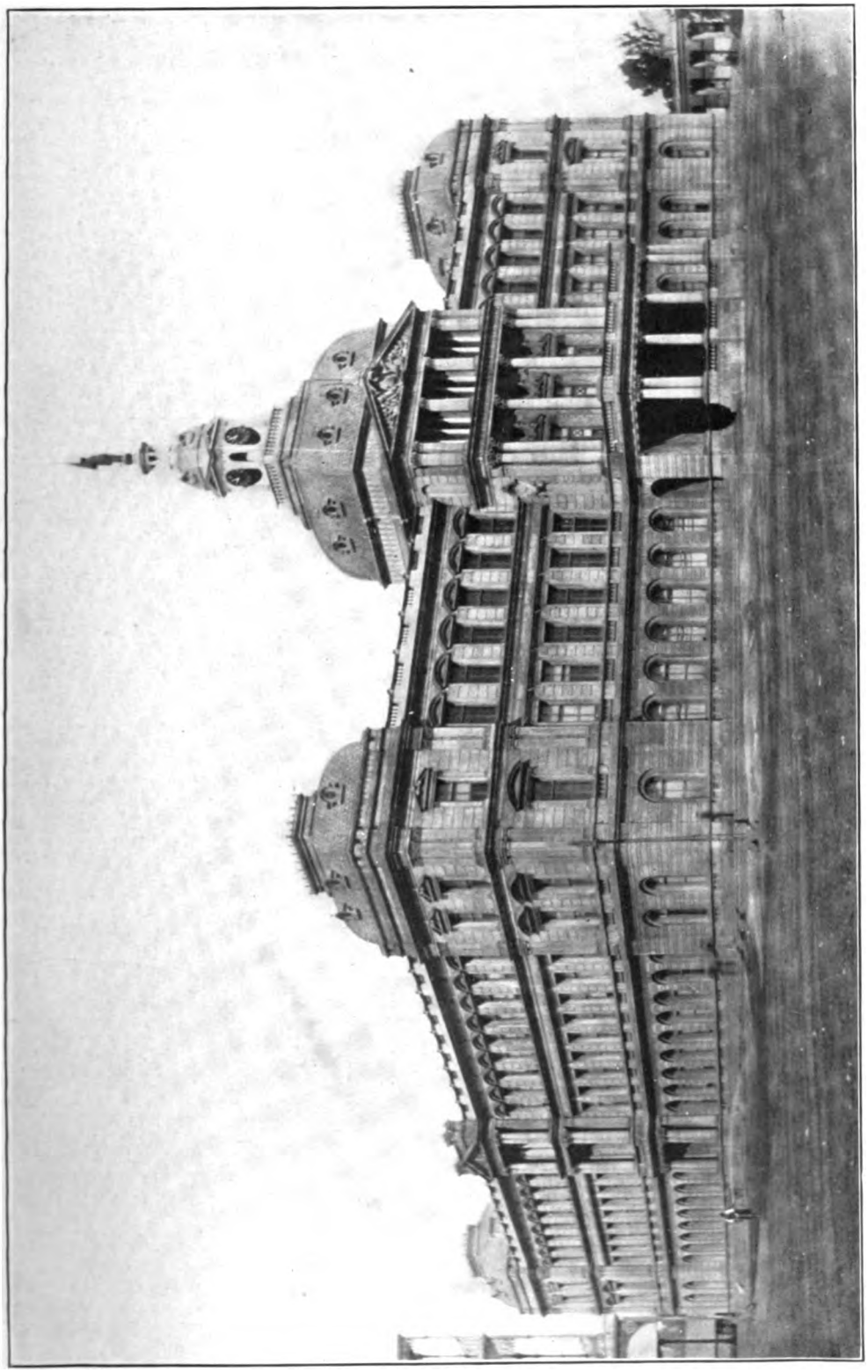
UNION SPRINGS, Ala., city, county-seat of Bullock County, on the Central of Georgia Railroad and the Birmingham and South Railroad, about 40 miles southeast of Montgomery and 175 miles northeast of Mobile. It is in an agricultural and fruit region. The chief manufacturing establishments are cotton gins, cottonseed-oil mills, cotton-mills, spoke and handle factories, grist-mills and a machine shop. The educational institutions are a high school, founded in 1899, public graded schools and several private schools. Union Springs was incorporated in 1844. Pop. 4,055.

UNION THEOLOGICAL SEMINARY IN THE CITY OF NEW YORK, The. It was founded in 1836, under the auspices of the Presbyterian Church; the directors and professors of the seminary give their assent to the Westminster standards of this Church, but students of all denominations are freely admitted. The seminary offers the following courses: (1) A three-years' course leading to a diploma requiring the study of Greek and Hebrew; (2) a three-years' course leading to the degree of B.D., requiring more hours' work and a higher standing than the diploma course, special work in some department chosen by the student and including a thesis; (3) a four-years' course requiring one year's graduate work and a thesis; (4) special and partial courses. For admission to the degree courses college graduation is required; for the diploma course college graduation or examination in Latin, Greek, philosophy, English and history. Part of the work in the regular courses is elective and some electives are provided for at Columbia and New York universities. The curriculum of the seminary includes courses in Old and New Testament philology and exegesis, biblical, systematic and practical theology (including study of missions), apologetics, Christian ethics, church history and history of religion, voice culture and sacred music. Training in actual Christian work is provided in churches and chapels, public institutions and settlement work; the Union Settlement is closely related, though not officially affiliated with the university. Seminary extension courses for lay workers were established in 1901. There are a number of undergraduate scholarships, graduate scholarships and two fellowships. The seminary buildings contain a chapel, lecture-rooms, library, museum, reading-room, gymnasium, social-room, and dormitory-rooms. The library in 1919 contained 130,131 volumes, including special collections in American and English history. The students in 1917 numbered 226, including the two Fellows and the graduates.

UNION UNIVERSITY, formerly Southwestern Baptist University, is located at Jackson, Tenn. The Baptists of Tennessee, realizing the necessity of an institution under their control, set about in 1845 for the establishment of such a school, especially for an educated ministry. It was located at Murfreesboro, under the name of Union University; during the Civil War the building was damaged, the equipment destroyed and endowment rendered worthless; these difficulties were partly overcome, and the University continued its work until 1873, when it was further crippled by an epidemic of cholera in Murfreesboro, and all exercises suspended. In 1875 a new charter was obtained and the name Southwestern Baptist University was adopted; since that time its prosperity has been continuous and the endowment has largely increased. In September 1907 by action of the board of trustees, the university resumed the original name, Union University. The organization of the university consists of (1) the College Department; (2) the Department of Theology; (3) the Teachers' College; (4) the Business School; (5) the Department of Oratory and Physical Development; (6) the Department of Music, and (7) the University Academy. The College Department offers two courses, leading to the degrees of A.B., and B. S.; certain studies are required in each course, while others are elective. The degree of A.M., is conferred for post-graduate work. The courses of the Theological Department do not lead to a theological degree, but are elective and receive some credit toward the degree of A.B., or B.S. The university is coeducational and the dormitory for young women was erected in 1897. In January 1912 the two main college buildings were destroyed by fire, but new buildings, in some respects very superior to the old ones, were erected. The library contains approximately 10,000 volumes. The students number 300; the Teachers' College over 200 and the faculty, 20.

UNIONIDÆ, a family of bivalved mollusks, the fresh-water mussels (q.v.).

UNIONISM, the principle of operating industries by union labor; that industrial system through which corporations or other employers hire their men by collective bargaining with organized bodies of workmen. (See AMERICAN FEDERATION OF LABOR; TRADE UNIONS; STRIKES AND LOCKOUTS). Although less than 2 per cent of the active workers in America belong to trades unions, yet this organized fraction dominates the policies in all the large industries, and has been very active for a generation in raising wages, shortening hours and improving shop conditions. It is a notable fact that the six leading countries in the Great World War are each imbued with unionism. In 1913, the year before the war broke out, the number of trade unionists in the leading nations was as follows: United Kingdom, 4,000,000; German Empire,



The House of Parliament, Pretoria

3,800,000; United States, 3,000,000; France, 1,050,000; Italy, 975,000; Austria-Hungary, 750,000. No other country had as many as 225,000 union workers. The unions of Great Britain, Germany and the United States expended each close upon $20,000,000 in that year to maintain their organizations, provide benefits, etc.

In the United States.— While the unions of Great Britain increased from 1,500,000 to about 2,800,000, those of the United States grew from 548,300 in 1900 to over 2,000,000 in 1910. The causes for this growth were, in the main, the great prosperity of all workers, the trust or combination idea, the many strikes and finally labor's natural growth. In 1895 the American Federation of Labor, the most powerful representative body in the United States — composing the great majority of organized workers, had perhaps 200,000 members. In 1910 the Federation had upward of 1,800,000, and in 1918 their membership totals a full 2,500,000. There are about 500,000 unaffiliated union workers.

The growth of trade-unionism in America is due in large part to the trust and combination movements of capital, and the many strikes in every trade, many of which were so successful that the workingman got a revelation of the power of organization, and the membership of some of the trades — the building and mining in particular — increased with leaps and bounds.

The Necessity for Labor Unions, as Illustrated in the Building Trades.— Great construction companies, wholesale employers of labor in the building trade, have been at war since 1899 more or less incessantly with the trade-unions. Strikes, lockouts and boycotts have been common in all the larger cities. Since 1901 the building industry has involved in the United States an annual outlay of something like $400,000,000 and employs more than 1,000,000 men. The experiences of the building trades in 1904 and the printing trades in 1906 demonstrated to the workmen the necessity for trades unions operating together, and this is now the fixed policy, accomplished through the American Federation of Labor.

Demands of Labor.— The demands of the American Federation of Labor made in resolutions will show what is sought by the American trade-unionists. These were:

1. Compulsory education.
2. The repeal of all conspiracy and penal laws affecting seamen and other workmen, incorporated in the Federal and State laws of the United States.
3. A legal work day of not more than eight hours.
4. Sanitary inspection of workshops, mines and homes.
5. Liability of employers for injury to health, body and life.
6. The abolition of the contract system in all public works.
7. The abolition of the sweating system.
8. The municipal ownership of street cars, waterworks and gas and electric plants for the distribution of heat, light and power.
9. The nationalization of telegraphs, telephones, railways and mines.
10. The abolition of the monopoly system of land holding and the substitution therefor of the title of occupancy only.
11. Direct legislation and the principle of referendum in all legislation.
12. The abolition of the monopoly privilege of issuing money and substituting therefor a system of direct issuance to and by the people.

The trade-unions of the United States are usually willing to resort to conciliation in the adjustment of differences as they arise, such conciliation to consist of committees representing each side and with equal power. They are usually in favor of arbitration when all means of conciliation have been exhausted, but they are opposed to compulsory arbitration, so called, and usually to compulsory investigation of the conditions attending a controversy. They do not object to although they have little faith in State boards of arbitration or other perfunctory legislative methods of adjusting difficulties. They are in favor of strict legislation relative to blacklisting. They claim that the blacklist is a rank injustice, and that wherever practised there is a degradation of the man blacklisted, and an annoying and irritating influence upon those who are not; that it is a menace to the well-being of labor everywhere. On the other hand, they do not hesitate to use the boycott in enforcing their demands, on the ground that it is a legitimate war measure against men who are considered as strike-breakers and thus traitors to the cause of labor. They insist that during periods of labor strikes or other controversies no man or body of men should be enjoined to prevent the doing of something which, if done, would be punishable under the criminal code; that they should not be debarred by injunction from picketing or patrolling, so-called, or from representing to non-union men that they had better not enter the service of the employer involved in a strike. They recognize their duty to avoid physical violence or intimidation, but claim that if some indulge in this, only those men engaged should be dealt with under the law. They insist that if they violate the law, and are thus amenable to punishment under it, they should not be subject to fines and imprisonment for contempt of court under an injunction; and they claim that all petitions for injunction should first be heard, either by a jury or otherwise, before they are subject to the process of contempt. They are not in favor of socialistic revolution; but that under the present industrial system their affairs can be adjusted, their claims fairly adjusted and their condition made reasonably satisfactory. They are, as a rule, in favor of the extension of State control in certain directions, but they are not social democrats as distinguished from State Socialists. They claim that the chief force which is extending State-socialistic doctrines comes from employers, through trusts and combinations and the aggregation of capital. They are, therefore, generally in favor of some regulation of fortunes and incomes, and the heavy taxation of incomes on some progressive principle. For statistics of labor troubles see STRIKES AND LOCKOUTS.

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Labor Movement' (1917), and publications of the American Association for Labor Legislation. Also 'American Labor Year Book' (New York ann.), which contains many facts not often seen in the newspapers.

UNIONTOWN, Pa., borough, county-seat of Fayette County, on three branches of the Pennsylvania and one branch of the Baltimore and Ohio Railroad, about 70 miles south of Pittsburgh in the southwestern part of the State. It was settled in 1768 by Henry Beeson, and it was first called Beesontown. It was incorporated in 1796. Uniontown is in an agricultural region, but the county is noted for its extensive annual output of coke. In the vicinity are coal fields, deposits of iron ore, glass, sand and natural gas. The chief manufacturing establishments are glass plants, two foundries, brick yards, planing mills, flour mills and machine shops and coke plants. There are several churches. The principal public buildings are the Uniontown Hospital, county courthouse, jail, County Home for the Poor and the schools and churches. The educational institutions are a high school and public elementary schools. The banks have a combined capital of over $350,000, with deposits amounting to over $3,693,770. Two trust companies have a combined capital of about $300,000 and deposits of over $589,290. The government is on the commission plan. The net funded debt is $300,000 and the total realty valuation is placed at $8,000,000, which is one-third of the market value. The tax-rate per $100 of assessed valuation is $1.35. Pop. 20,000.

UNIONVILLE, Mo., town, county-seat of Putnam County, on the Chicago, Burlington and Kansas City Railroad, about 140 miles, in direct line, north by west of Jefferson City. It is in an agricultural and stock-raising region and in the vicinity are large coal-mines. The industries are chiefly connected with farm products and mining. The educational institutions are the public graded schools, one private school and a school library. Pop. 2,200.

UNIT. See UNITS OF MEASUREMENT.

UNIT SOCIAL ORGANIZATION, a sociological experiment which aims to bring all the people into a more active, intelligent and continuous participation in their own affairs, to vitalize municipal government and bring it closer to the lives of the people. The movement for this social plan was born in New York in 1916 and soon spread westward. The National Social Unit Organization advertised in 1916 for a community of 15,000 people somewhere in the United States which would be willing to try out its plan. Sixteen cities responded favorably, and Cincinnati, with well-federated social activities, a fine municipal university and with one of the best general hospitals in the United States, was chosen. The Mohawk-Brighton district of Cincinnati, a section populated largely by a native-born working class of Americans of skilled occupations, was selected as the experimental laboratory there. The original plan called for an experiment of three years, at the end of which time the work done was to be evaluated and a decision reached as to its extension. As it worked out in the Mohawk-Brighton district, two fundamental ideas of organization are involved. First, for the purpose of procuring the constant, active supervision of 100 per cent of the people over community affairs and also for the purpose of procuring representation by persons who actually know the people they represent. A block organization was formed consisting of a block committee, or council of seven, elected by preferential ballot by all the men and women in the block more than 18 years old, who in turn selected the block worker or block executive who sits on a central citizens' committee and forms one-half of the neighborhood administration.

Groups were organized from the community, physicians to plan for public health, nurses to plan nursing, recreation workers to study and plan for the community's play needs, the trade unions to report the workingman's point of view in the solution of neighborhood problems, business men to assist in the neighborhood business administration and teachers to plan a program of neighborhood education. Gifford Pinchot was chosen chairman of the National Citizens' Council of the Social Unit Organization. The social unit promoters have a distinct theory of unit organization, and their whole attitude toward its application is experimental. Having successfully applied the principles of organization for three years in one district, they are preparing to extend on a city-wide basis only those parts of the plan whose results have been demonstrated as beneficial.

UNITARIANISM. The Name.— So far as is known the name Unitarian originated in Hungary. It was used there at first as the title of an association of religious believers of various sorts in the year 1568 or thereabouts. Peter Bod, the Transylvanian historian, who was too bitterly prejudiced against the doctrines constituting Unitarianism to make his statements concerning it always trustworthy, relates that in 1557 the Diet of Thorda in Transylvania passed an edict (ratified in 1563) granting universal freedom of worship. At about the same time the various religious bodies within the country formed a league of toleration pledging themselves not to persecute one another. The members of this league were popularly called «The United» or «Unitarians.» So at first the title carried no sort of theological significance whatever. Embracing as it did all kinds of Christian believers, it indicated simply a fraternal relationship. This league, or union of fraternity and tolerance, did not long endure. Dissensions arising from more or less sharp differences of belief resulted in the withdrawal of those who held that belief in the dogma of the Trinity was fundamental to Christian faith and not to believe it an almost unpardonable sin. This withdrawal emphasized the Trinitarianism of those who withdrew and the lack of it in those who remained loyal to the league. These latter were the non-trinitarians, perhaps anti-trinitarians, believing in God as One instead of «God in Three Persons.» They were called Unitarians, however, not because of this belief, but because they still remained members of the league of «The United» or «Unitarians.» It was natural and unavoidable that the title should come at last to mark the distinguishing faith of those persons who remained loyal to the league. While «no confirmation of this can be found from Unitarian sources» Bod's explanation is probably not far wrong. Un-

less something of this sort had happened it is more than likely that the belief that "God is One" would have at that time been called by the distinctly theological term "Arianism." What is certain, however, is that the name Unitarian appears in the decree of the Transylvania Diet at Léczfalva, 25 Oct. 1600. Thirty-eight years later the name was ratified by Transylvania Unitarians as the official designation of their churches. It may well be assumed, in the absence of contrary testimony, that this name was chosen as the official designation instead of the purely theological term Arian because of the meaning it had when used as the name of the league of fraternity and tolerance. Although since then it has come to have a distinctly theological significance, and is to-day generally used to distinguish those persons and churches within Christianity who stand for simple monotheism from those who hold the Trinitarian formula, yet this early non-theological meaning of the name does best express the meaning which most Unitarians to-day give it.

History.— Unitarianism, that is the faith of those in Transylvania who in 1600 accepted the name as the official designation of their churches, and of those who since and in other countries have adopted the name or had it applied to them, may be said to be a belief that "God is One." The most conspicuous point of departure from Trinitarianism, the point usually emphasized, is the refusal to regard Jesus as "very God of very God" and the assertion that he was distinctly and unqualifiedly a human being. This belief in some form and of varying degree "has accompanied Christianity from the beginning, at least as one of its forms." Tertullian (circa 200), the first to introduce the term Trinitas into Christianity, is authority for the statement that in his day "the common people think of Christ as a man." It is usually conceded that even though it might not be correct to speak of Christianity during the first two or three centuries as being substantially Unitarian, it at least was not Trinitarian. It was this generally held belief that Christ was a man that Arius was trying to save in his conflict with Athanasius. It was this championship of Arius, of the human side of Jesus, that for centuries gave the name Arianism to any belief in the humanity of Jesus. But as the Arians expressed their belief in the great theological controversy that was had at Nicea (325), the difference between them and the Trinitarians was not very marked. The latter insisted that Jesus Christ was "of one substance" with the Father, the Arians refusing to go further than to concede that the Son was "of like substance" with the Father. Although the decision at Nicea was against the Arian view, faith in the simple humanity of Jesus persisted all through the centuries, and those who held this view were usually subjected to bitter persecution. Differing interpretations of the Trinity were the cause of frequent disturbances within the Church from the time of Arius but it is not until the upheaval occasioned by the Reformation of the 16th century that really serious anti-trinitarian opinion and propaganda are met with. So rapidly did these opinions gather force and win considerable following that the "reformers" no less than the Roman Church found it necessary to take measures against them. According to the temper and civilization of the times such measures were not marked by gentleness or humanity. Anti-Trinitarian opinions were, however, nourished rather than suppressed by persecution.

The burning of Servetus (1553) at the stake in Geneva, at the direct instigation of Calvin, for the sin of writing and publishing (1531) the book 'Errors of the Trinity' (Calvin's copy is one of the two or three copies of this book surviving) may be said to mark the beginning of Unitarianism as a definite and continuous movement. But Michael Servetus was not the first to suffer martyrdom for disbelief in the Trinity. Bishop Mant in his 'History of Ireland' records that in 1326 at Dublin one "Adam Duff was burned alive for his denial of the Trinity." In 1551 George Van Parris was burned for a like offense. Before Servetus there were others who had written against the Trinity; among these may be mentioned Martin Cellarius (1499–1564), a close friend of Luther, and Ludwig Haetzer, whose views, however, were not disclosed until after his execution (1529) for anabaptism. But it was Servetus who first put the issue squarely before the world. "Your trinity," he writes, "is a product of subtlety and madness. The Gospel knows nothing of it. The old Fathers are strangers to these vain distinctions. It is from the school of the Greek Sophists, that you, Athanasius, prince of tritheists, have borrowed it."

In Poland and Hungary.— A group of men in Italy had incurred displeasure because of their more or less outspoken opposition to belief in the Trinity, and they concluded it was the part of wisdom to move to other countries. Among these were Lelio Socinus and his uncle, Faustus, and Giorgio Blandrata or Biandrata. The greatest degree of freedom of religious thought was to be found at this time in the countries of Poland and Hungary. Considerable anti-trinitarian preaching was going on there. In Poland the names of Gonesius and Gregory Pauli are the most noted, and in Transylvania Bishop Francis David. With the coming of Blandrata, a physician, to Poland in 1558, "the spirit of Unitarian dissent entered upon a career of marked activity and success." In 1565 "a division of Polish Protestants took place, resulting in the establishing at that time of a Unitarian church." Fourteen years later (1579) Faustus Socinus (Zozzini) took up his residence at Cracow, and under his leadership the Unitarians, or, as they were more popularly known, Socinians, became a numerous and powerful body, "distinguished by the rank of their adherents, the ability and learning of their scholars, the excellence of their schools, and the superiority and wide circulation of their theological literature." Racow was their theological and educational centre. Here was published the Racovian Catechism — the first Unitarian catechism — in the Polish language in 1605. In 1608 it was issued in the German language and in the Latin in 1609. In the preface to a later and revised edition of this catechism the Unitarian attitude and spirit of this period are reflected in the remark, "we think we need not blush if our Church continues to make progress in some matters." A few years after the death of Socinus (1604) the Catholic reaction made itself felt. Unitarian churches and schools and printing estab-

lishments were gradually closed and confiscated, and in 1658 all adherents of "the Arian and Anabaptist sect were commanded to quit the kingdom within two years." Thus ended organized Unitarianism in Poland.

In the neighboring kingdom of Transylvania (Hungary) the Unitarian movement ran a somewhat similar course, except there it was not wholly destroyed by the Catholic reaction. There is some dispute as to the actual founder of Unitarianism in this country. Blandrata — who later was instrumental in starting the persecution of Unitarians when for purely personal reasons he sought to return to the Catholic Church — in 1563 came from Poland to Transylvania and "was made physician-in-ordinary to the king, John Sigismund"; and it is assumed that "through his influence the king, the king's mother, and many nobles accepted the Unitarian faith." Francis David, "now regarded as the true apostle of Transylvania Unitarianism," was elected (1564) bishop of the Calvinistic churches. His liberal and eloquent preaching attracted multitudes in Klausenberg, and caught the attention of Blandrata, who used his good offices to have him appointed chaplain to the king in 1566. Here he preached the doctrine that "he who divided Christ into two, man and not man but God, he is a deceiver." In 1568 was issued a royal edict, confirmed by the Diet, giving to everyone complete freedom of conscience and of speech. During this year a great public debate was held with David and Peter Melius, a strict Calvinist, as the chief debaters. David triumphed and that "day the whole people of the town of Kolozsvar became Unitarian," which is probably an exaggeration but plainly reveals the power of David's preaching. "The example was followed by a large number of Transylvania towns." At about this time there were in this country 425 congregations Unitarian by profession. "In 13 higher schools and colleges besides that doctrine was taught by able professors, several of whom were refugees from other lands." By 1578 a serious controversy developed within the Unitarian churches. Blandrata, who was preparing to save himself in the powerful Catholic reaction which he saw coming, headed the party who were for maintaining that "Christ should be invoked with divine honors, though without any inherent title to such homage," and he called to his aid Faustus Socinus, who was a noted champion of this idea. The result was a "public explosion on David's part against the cultus of Christ in any shape or form." Whereupon, at the instigation of Blandrata, articles were drawn up "accusing David of innovation of doctrine," and presented to the Roman Catholic king then reigning. The accused was condemned to imprisonment for life. "Five months later (1579) he died in the dungeon at Deva." Despite the confiscation of their schools and churches and printing establishments which followed, the Unitarians maintained their existence and with the enactment of a statute in 1791 granting "equal liberties and rights in Transylvania" a new day dawned for these churches. To-day there are 116 churches with a total membership of 80,000. These churches are presided over by Bishop Joseph Ferencz, a bishop being made necessary by the laws of the country.

England.— The organized beginnings of Unitarianism in England may be said to date from about 1773, when Theophilus Lindsey, on the failure of the petition for relieving clergymen "from the burden of subscribing to the thirty-nine articles," resigned his "living in Yorkshire and gathered the first professedly Unitarian church in London." Prior to this time, however, there was considerable anti-trinitarian sentiment. From 1551 to 1612 no less than nine persons suffered martyrdom on this account. In 1614 a Latin version of the Racovian catechism was publicly burned in London. Such treatment did not avail to stop the spread of this sentiment as is evident from an ordinance passed in 1648 making denial of the Trinity a capital offense. This ordinance was rendered inoperative by Oliver Cromwell, who refused to sanction the prosecution of Paul Best and John Biddle. The latter occasionally, from 1652 to 1662, held a "Socinian conventicle in London" and published much Unitarian or Socinian literature. In 1655 the great Dr. Owen complained that "there is not a city, a town, or scarce a village in England where some of this poison is not poured forth," and the Act of Toleration (1689) specifically excluded papists and deniers of the Trinity. Thomas Emlyn, fined and imprisoned (1703) in Dublin for rejecting the deity of Christ, preached Unitarianism in London in 1705. William Robertson in Ireland — sometimes called the father of Unitarian non-conformity — seceded from the Established Church at a date earlier than Lindsey. The scholarly Nathaniel Lardner in 1730 advocated in his writings a purely humanitarian view of the Christ, as did also Dr. Joseph Priestly in 1767. A century before this John Milton taught a similar gospel in his 'Christian Doctrine.' Isaac Newton was an anonymous writer on the same doctrine and John Locke in his 'Reasonableness of Christianity' (1695) ranged himself on the same side. Dr. Samuel Clarke, Isaac Watts and Phillip Doddridge aided materially in the spread of "Socinian and Arian views among dissenters." When Dr. Lindsey withdrew from the Established Church and set up a Unitarian meeting-house in London, a number of ministers of Presbyterian chapels soon followed his example. In the case of these latter it was not necessary for the ministers to withdraw from the ministry of these institutions because the chapel trust deeds gave freedom of theological opinion, so there was nothing to prevent the chapels from accepting the Unitarian views. Thus it came to pass that a number of chapels with open trust deeds bodily went over to the Unitarian movement inaugurated by Dr. Lindsey.

In 1791 the Unitarian Book Society for the distribution of literature was organized, and from then on Unitarianism becomes a definitely organized force in the religious life of England. In 1844 all civil disabilities which Unitarians had suffered were removed.

At present there are in Great Britain 370 places of Unitarian worship. The number of members is not known and estimates are useless. Manchester College, Oxford; The Unitarian Home Missionary College, Manchester; and Presbyterian College, Carmarthen, Wales, are the training schools for British Unitarian ministers. The British and Foreign

Unitarian Association, with headquarters at Essex Hall, Essex street, London, is the organization through which missionary and denominational enterprises are carried on. *The Christian Life* and *The Inquirer*, London, are the leading denominational periodicals.

America.— It would not be correct to assume that Unitarianism in America, which appears subsequent to its organized existence in Europe, originated independent of all foreign influence. The intercourse between the people of the Old World and the New made that impossible. Besides, the migration of people from the older countries to America in search sometimes of a greater freedom naturally included some of the Unitarian way of thinking and believing. The most notable and influencing single incident was the coming of Dr. Joseph Priestly to the United States in 1794. Two Unitarian churches were founded by him, Northumberland, Pa. (1794), and Philadelphia (1796). The Unitarian church (1803) at Oldenbarnveld, later Trenton, now Barneveld, N. Y., was founded by a group of Dutch refugees who had close relationship with the English Unitarians. These three churches have played a considerable part in the spread of Unitarianism in America, and the church at Barneveld furnished the inspiration to Mr. Huidekoper who later founded the theological school at Meadville, Pa.

But, broadly speaking, American Unitarianism is of American origin. It is in part the fruit of the spirit of religious freedom embodied in the *Mayflower* compact, and in part the result of the democratic form of government which ruled the New England parish churches. It is a suggestive and significant fact that the oldest Pilgrim church in America, that founded at Plymouth in 1620, in 1801 declared itself to be Unitarian by a large majority vote, and this without making any change whatever in its covenant. This church, now Unitarian in name and fellowship, uses the identical statement of faith drawn up by its Pilgrim founders. American Unitarianism is in large part the product of the habit of many notable New England divines of thinking and speaking their own thoughts and of their utter dislike of anything that savored of monarchy in religion as well as in politics. It was also a product in part of their rebellion against what seemed to them to be the moral defects of the popular faith.

Before 1825, the date usually adopted as the beginning of organized Unitarianism in the United States, the ideas peculiar to Unitarianism were being preached by an ever-increasing number of the New England clergy and laity. It is not possible within the space of this article to trace these beginnings. To Jonathan Mayhew, settled as minister of the West Church in 1747, belongs the honor of being the "first outspoken Unitarian in New England, not merely because he rejected the doctrine of the Trinity, but because he accepted all the cardinal principles developed by that movement since his day." More important, in some respects, was the action of the corporate body of King's Chapel, Boston — the first Episcopal church in New England — declaring for Unitarianism by inviting (1782) Rev. James Freeman to become its minister, and three years later voting to revise its Episcopal ritual by eliminating all Trinitarianism therefrom. During the last decade of the 18th century Unitarianism is reported to be "on the increase in the Southern counties of Massachusetts" and that "it is on the increase in Maine," but with the exception of King's Chapel and temporary societies in Portland and Saco, Me. (1792), the churches established at Northumberland (1794) and Philadelphia, Pa. (1796), there was nothing in the way of organized Unitarianism before the opening of the 19th century.

The next important incident after the action of King's Chapel was the outcome of a controversy within the old church at Plymouth. In 1799 the church and parish, voting separately as was the custom, chose the Rev. James Kendall as minister. The minority, opposed to the liberal or Unitarian views of Dr. Kendall, withdrew from the old church and established the church known as the "Church of the Pilgrimage," leaving the church of Brewster and Robinson to become one of the pioneer churches in the Unitarian movement. Thus far the movement had gone along without creating anything more than local dissensions. But signs rapidly multiplied of the coming storm which was to rend New England Congregationalism into Orthodox and Unitarian. With the opening of the 19th century the clergy of the stricter sort were writing and speaking more critically and impatiently of the unorthodoxy that was being preached by a considerable number of eminent clergy. In one instance it went further than critical words. The Rev. John Sherman (grandson of Roger Sherman), minister of the First Church, Mansfield, Conn., was expelled (1805) from the Windham County Ministerial Association for his anti-trinitarianism. In his defense he published the first anti-trinitarian pamphlet on this side of the Atlantic, the title of which was "One God in One Person Only." The election of the Rev. Henry Ware, known as a Unitarian, as Hollis professor of divinity at Harvard College, was the signal for controversy and open strife to begin. Immediately a war of pamphlets and sermons and periodicals was on and separation came to be ever more and more inevitable. The stricter brethren widened the breach by establishing in 1808 a theological school at Andover to train clergy free from taint of the Unitarian heresy. The men charged with this heresy steadily denied that they were Unitarians or had any desire or purpose of being such, but in 1812 Dr. Belsham of England published his life of Theophilus Lindsey and in it he included a chapter on American Unitarianism which revealed a "much closer alliance of several Boston liberals with the movement in England than they had been supposed willing to admit." In 1815 Dr. Jedidiah Morse saw the volume and forthwith gave wide publicity to the facts. He went further and in his periodical, *The Panoplist*, virtually charged the exponents of Unitarian ideas in New England with being afraid to come out in the open and acknowledge the real character of their teachings. Whatever the merits of the accusation — and the accusation is not without prejudice — it forced the controversy to a crisis which eventually resulted in the severance of New England Congregationalism into "Orthodox" and "Unitarian" by the withdrawal in many cases from the old parish churches of

the orthodox party, leaving those of Unitarian ways of thinking in charge of the old church properties and organization. This seems to suggest, what is further borne out by an examination of the early New England church covenants, that the Unitarian movement in New England and consequently in America was not a secession from Congregationalism but a development of the principles upon which it was founded.

The men charged with heresy did not hesitate to show their colors. Such men as William Ellery Channing settled over the Federal Street Church in Boston in 1813; Edward Everett, who became minister of the church in Brattle street in 1814; Francis Parkman settled at the New North Church 1812 and others met the charges and criticisms by a more definite and outspoken presentation of the things they held to be true. Their position is not correctly described as being mainly anti-trinitarian. They virtually called in question the whole doctrinal structure of orthodoxy. This was made clear by Dr. Channing in the sermon — now a historic landmark in Unitarianism — preached at the ordination of Jared Sparks in Baltimore, Md., in 1819. Dr. Channing used this occasion "to give a distinct statement of the opinions generally held by his liberal brethren,— their mode of interpreting the Scriptures, their views concerning God and Christ, their idea of the nature of his mission and mediation." This sermon marks the parting of the ways. The following year, overcoming their repugnance to even appear to favor organizing another religious body, the "liberal" ministers organized the Berry Street Conference for discussion among themselves. Five years later (1825) "a club of some 25 liberal-minded and public-spirited citizens organized for social and philanthropic purposes," which had existed in Boston for some years, at a meeting held at the residence of Hon. Josiah Quincy, discussed "the advisability of forming an association to publish books and tracts setting forth the opinions and principles of the liberal party in the Congregational churches." The outcome was the forming, on 25 May 1825, of "a new society to be called the American Unitarian Association." By a chance coincidence the British and Foreign Unitarian Association was organized on the same day. Henceforth Unitarianism is recognized as one of the religious bodies of America.

In America, as elsewhere, Unitarianism has experienced many conflicts within itself. The old order of things, the old thoughts were continually being challenged. In the early years Unitarians retained much supernaturalism in their belief and forms of worship as is seen in the fact that Ralph Waldo Emerson felt under the necessity of resigning as minister of the Second Church in Boston because the church refused to "discontinue or radically change the order of communion service." It became more and more clear that the genius of Unitarianism was fundamentally out of harmony with traditional and popular Christianity. This, for the first time, was most conspicuously evident when, in July of 1838, Mr. Emerson addressed the graduating class of Harvard Divinity School. This address, on account of its unusually frank criticism of the traditional views of the "Divine Nature, Jesus, Christianity and of the offices of the church," started a controversy within Unitarianism which was destined not to end until the "traditional" views were practically eliminated. Great impetus was added to this controversy and a division seemed to threaten, when Theodore Parker spoke on "the transient and permanent in Christianity" on 19 May 1841. This was further expounded in the following winter in a series of five lectures which he published under the title of a 'Discourse of Matters Pertaining to Religion' So acrimonious became the discussion that many of Parker's fellow Unitarian ministers hesitated to call him a Christian. The central principle of Unitarianism which from the first had been the right of private interpretation and freedom of speech was strong enough, however, to prevent any serious rupture. A few years later the right of a man to think his own thoughts and to speak them in religious matters became something of an issue through the attitude of the American Unitarian Association toward Theodore Parker. His frank departure from traditional beliefs and customs prompted the more conservative members of the denomination to scrutinize closely the beliefs of the young men coming into the ministry, and to create an atmosphere uncomfortable to too advanced thinkers. The men of the Middle West, while not taking sides in the doctrinal controversy which Emerson and Parker had precipitated, felt there was a distinct menace to freedom of thought and expression in the attitude taken toward Dr. Parker, and so when these men of the Middle West organized in 1852 the Western Conference they were stoutly resolved to preserve the right of men to think and speak as they believed. In the following year, in giving advice to the missionaries of the conference, it was stated that under no circumstances should they require "subscription to any human creed, or the wearing of any distinctive name." With the denominational reawakening which came after the Civil War the question of the basis of fellowship became an issue. In 1865 the National, now the General Conference of Unitarian and Other Christian Churches, meeting biennially, was organized and the basis of fellowship although very broad was considered too narrow by some of the more radical, who thereupon organized the Free Religious Association. These conflicts came to an end by the action (1894) of the National Conference in adopting the present preamble to the constitution of that body. That is, Unitarians decided once and for all that within organized Unitarianism there should be absolute freedom of thought and expression. The constitution of the General Conference reads: "These churches accept the religion of Jesus holding, in accordance with his teaching, that practical religion is summed up in love to God and love to man . . . we cordially invite to our working fellowship any who, while differing from us in belief, are in general sympathy with our spirit and practical aims." With this jealous insistence upon freedom of thought and speech for every individual, Unitarianism, or rather the Unitarian churches, have gone along associating themselves together in an increasingly effective organization. Lacking a central authority to compel obedience the Unitarian body lacks the driving power essential

to conspicuously successful propaganda. Unitarianism can only appeal to those who are thinking in its direction.

The character and aim of the organized activities of the denomination are evidenced by the various departments into which the American Unitarian Association (Boston, Mass.), the executive branch of the denomination, is divided. The publication department, besides printing and publishing books of a more or less denominational character, aids in the work of Unitarian propaganda by printing and distributing tracts to the number of about 400,000 copies annually, while the publicity department "has for its special work the diffusion of Unitarian principles through the medium of the press." The department of comity and fellowship "has jurisdiction over matters connected with interdenominational interests and seeks to substitute co-operation for competitive methods in church work." There is also a department of church extension and a department of community service. The latter aims "to promote in the churches a study of social problems," and "to cultivate closer and more sympathetic relations between the churches and the wage earners." The committee on new Americans is engaged in missionary work and establishing churches among Americans of foreign birth and speech. The department of religious education seeks "to correlate and vitalize the endeavors of the denominational Sunday schools." It issues manuals and lesson helps, conducts Sunday school institutes, provides lecture courses for teachers and aims to introduce and encourage modern methods in religious education in the Unitarian churches. There is a department of foreign relations, not foreign missions. The following quotation expresses the denominational attitude: "Foreign missions have never commanded a general interest on the part of Unitarians. Their dislike of the proselyting spirit, their intense love of liberty for others as well as themselves, and the absence of sectarian feeling have combined to make them, as a body, indifferent to the propagation of their faith in other countries. They have done something, however, to express their sympathy with those of kindred faith in foreign lands." As early as 1824 the Unitarians of America took a lively interest in the Hindoo leader Rammohun Roy, who had "adopted Unitarianism," and also in the work of the Rev. William Adam, a Baptist missionary, who had become converted to Unitarianism in India and in 1826 joined with the English Unitarians in a plan to send a sum of money yearly to aid the work there of the British Indian Unitarian Association. In 1853 the Rev. Charles H. A. Dall was sent from this country to Calcutta, where he devoted himself to the work of education rather than of preaching. He founded the Calcutta School of Industrial Art, the Useful Arts' School, the Hindoo Girls' School as well as a school for the waifs of the streets. "His influence was especially felt in the education of girls and in industrial training, in both of which directions he was a pioneer." Since the death of Mr. Dall the aid given India has been through the natives themselves, particularly through the Brahmo-Somaj, which has societies and houses of prayer all over India, and is engaged in religious, educational and reformatory work. In 1884 Yukichi Fukuzawa started a movement in his country, Japan, looking "to the introduction of a rational Christianity." In response to an urgent request from Japanese the Rev. Arthur M. Knapp was sent to Japan in 1889 to investigate, and later in that year Mr. Knapp was prepared to begin work. In defining the purpose of his mission Mr. Knapp said, "receive us not as theological propagandists, but as messengers of the new gospel of human brotherhood in the religion of man." The work of Mr. Knapp and his colleagues was wholly educational. "No churches were organized by the representative of the American Unitarian Association. Those that have come into existence have been wholly at the initiative of the natives themselves." In 1896 was organized the Japanese Unitarian Association, which, through the co-operation of influential and scholarly Japanese, is helping to liberalize religious thought throughout the country in both the Buddhist and Christian communions. In Italy the Unitarian work is carried on by the Association of Free Believers. A Unitarian association has been organized in Brazil by Brazilians, and movements Unitarian in everything but name are to be found in Switzerland, Holland, Norway and Denmark. There are Unitarian churches in the English-speaking countries, South Africa, Australia and New Zealand.

In the United States and Canada to-day there are about 475 churches and missions. Although the census of the membership of these churches is given in various publications, as a matter of fact there is no official census of Unitarian membership. This is due to the fact that usually Unitarian ministers have little interest in church membership. Unitarian ministers are educated at the divinity school of Harvard University, which school "was founded and endowed by Unitarians"; the Meadville Theological School, Meadville, Pa.; the Pacific Unitarian school for the Ministry, Berkeley, Cal. The *Christian Register; Unitarian Word and Work*, Boston, Mass., are the leading denominational periodicals.

What Unitarians Believe.— Popularly a Unitarian is one who does not believe in "the divinity of Christ," or more correctly in the deity of Christ. That is but another way of saying that Unitarians do not believe in the Tritarian formula expressed in the Athanasian and Nicean creeds and embodied in all Protestant orthodox creeds. Because of this lack of belief in the Trinity, Unitarians are classified in the United States Religious Census as "non-evangelical," and are usually officially classified by the "Evangelical" bodies as non-Christian. This latter classification was very definitely made at the organization of the Federation of the Christian Churches of America in 1905. This officially representative body of "Evangelical" churches decided that to qualify as a "Christian" church there must be a complete acceptance of the Trinitarian formula. Unitarians decline to accept that decision and emphatically insist that it is not necessary to be a Trinitarian in order to be a Christian. To support this contention they point out that, so far as is known, Jesus himself did not teach the doctrine of the Trinity, neither did the Apostles. The only passage in New Testament literature which in any way reflects or embodies the Trinitarian

formula is that in 1 John v, 7, so plainly an interpolation that it is dropped from the Revised Version without any comment. Thev also point out that it was at least 150 years after the crucifixion of Jesus before the term Trinity began to be used by Christian teachers, and it was considerably later than this before the Trinitarian formula was decided on as the Christian conception of deity. Unitarians hold that this doctrine, instead of coming from anything Jesus or the Apostles or their immediate successors taught, is altogether of heathen origin, though this is not necessarily anything against it. So they argue that in rejecting the Trinitarian formula and insisting on a pure monotheism they follow much more closely the teachings of Jesus than do the Trinitarians. For this reason they insist that they are entitled to be regarded as Christian. However, Unitarians care little for a *name*. The important thing is to be Christian in spirit. They always speak of themselves as Christians. "But," as Dr. Lowe expressed it when the wisdom of adopting the name as a part of the official title of the national organization was being thoroughly debated, "I will oppose, as a test (of fellowship), any *definition* of Christianity." That was designed to indicate that Unitarians regarded Christianity, not as a set of definitions of God and Christ, but rather the Christ spirit which a man is under obligation to put into his every day life.

Unitarians have no creed, no *official* theology. They have "statements" of faith, The most popular being: "The Fatherhood of God; the Brotherhood of man; the Leadership of Jesus; salvation by character; the progress of mankind onward and upward forever."

But this is in no sense final or authoritative, it is simply an attempt to set forth the things most commonly believed. There are forms for admission into Unitarian church-membership, but in no case is any sort of doctrinal test imposed or implied. This arises not from any lack of religious belief or conviction among Unitarians, but, first, because they hold that belief in and frequent recital of a creed does not necessarily make a person Christian or even religious; secondly, guided by experience, Unitarians feel very strongly that no church or council ought or has any right to require any person to commit himself for all time to some particular form of worship, or sacraments or dogmas no matter how true they seem to be. They are not willing to accept as spiritual guides men who had so imperfect an understanding of the world they lived in as did the makers of Christian creeds. Believing in the spiritual imperfection of all persons and institutions, past as well as present, Unitarians feel that creeds and sacraments which change not make it impossible or unnecessarily difficult to press forward to a finer spiritual quality in life. Believing as they do that man is a progressively spiritual being in this world, they insist that the last word in religious truth has not been uttered and the goal of spiritual endeavor is still far ahead. For this reason Unitarians refuse to have anything to do with finalities and infallibilities in religion.

There is nevertheless a Unitarian faith which binds Unitarians together in a common purpose and a sort of common understanding of religious matters. It has been expressed thus: "Just as an association of scientists is constituted and sustained not by the adoption of a theory, however certain, but by a common purpose or aim, so a church is possible by virtue of the common purpose to seek contact with the divine life and to find mutual expression of the experience." Although Unitarians are free to formulate each his own conclusion there runs through all the consequent diversity of opinion strands of a common faith and on all great religious issues there is among them a quite strong agreement. There is space for only a few brief hints on this point.

Unitarians are verv modest when it comes to speaking of the Infinite Spirit "in whom we live and move and have our being." To believe in, to have a lively consciousness of God, they do not consider it needful to assume a detailed familiarity. They shrink from frequent repitition of the name and also from using any word or phrase that suggests an anthropomorphic conception. Unitarians most commonly speak of God as Father, not because that is an adequate or exact term, but because it suggests the finest, the most universal, the most unselfish elements a man can conceive of or aspire to. Perhaps the term is generally used by them because it suggests that this overshadowing, transfusing spirit is all the time prompting, tempting man to grow up into the divine likeness, just as the noblest of human fathers prompts his child to grow up in the likeness of the father's noblest self. Whether a distinct personality shall be ascribed to the idea of the Divine Fatherhood is a matter which each must decide for himself. They incline to the belief that a definite idea about God cannot be communicated from one to the other by a series of words or by a formula as is a law of science or a principle in mathematics, but that the idea must come from one's intuitive or acquired understanding. In thinking and speaking of God Unitarians are guided by the revelations of science no matter how recent, because they hold that if God is the living principle in things, that spirit which seems to be forever shaping the world of human life toward ever finer issues, then plainly a more accurate understanding of the Divine Spirit will come with every new discovery, every step toward the ultimate truth of things. Unitarians prefer to speak of their *thought of God* rather than of a *belief in God,* for the reason that the former phrase indicates that God is becoming more clearly revealed and that future generations will know more than is yet known concerning the Divine Spirit. While Unitarians do not believe it possible to express their thought or consciousness of God in a phrase there are two Biblical utterances which they frequently quote as expressing their idea. "Hear O Israel: the Lord our God is One Lord" (Deut. vi, 4) and "God is Spirit and they that worship Him must worship Him in spirit and in truth" (John iv, 24).

The Unitarian idea of Jesus is that he is in all respects a human being. They hold that the idea that Jesus was "a man and something more" makes his "life of singular purity, elevation, courage, sanity and devotion" worthless as an example to beings who are *only men.* Also a Christ "conceived of the Holy Ghost and born of the Virgin Mary" adds no distinction or force to anything Jesus said or did

or was. That idea simply makes him one of many mythological beings which form the centre of many religions. Unitarians contend that the Christ of miraculous birth is not the historical figure of the Gospels, but an imaginary being created by theologians, in the days when there was no knowledge of science or history, for the purpose of meeting the necessities of a very elaborate scheme of saving man from "the wrath to come." They insist, without any sort of reservation, that Jesus was an historical person; that he was the son of Joseph and Mary. This they set forth not as a dogma but as belief imposed upon them by such facts as are known. They point out that while there are great and irreconcilable differences between the two New Testament stories of Jesus' birth, the only two Gospel narratives that include these stories fully agree in regarding Jesus as the son of Joseph. Thus in the genealogies, Matt. i, 2-6 and Luke iii, 23 ff, the lineage of Jesus is traced through the male line, the author of Luke iii, 23, going so far as to say that Jesus "was, as people supposed, the son of Joseph." Then there is the testimony of Tertullian (cir. A.D. 200) that at that period "the common people think of Christ as a man." The Unitarians accept the verdict of history that Jesus was a man. They agree that he may have manifested an unusual degree of divinity or godlikeness — divinity as they understand it refers to the quality of a person's character and not to the nature of the body — that he may have possessed unusual spiritual gifts and psychical powers but they hold this does not warrant them in regarding him as being other than human. There is no disposition among Unitarians to take each and every idea ascribed by the Gospel writers to Jesus and attribute something like infallible authority to such ideas. It is less the words of Jesus than the spirit he put into all his deeds and relationships which they revere and accept as constituting the "leadership of Jesus." Unitarians hold that the abiding and growing influence of Jesus upon the world proceeds from the excellency of his manhood. His name is an increasing inspiration because he himself was man enough to stand for wonderfully fine ideals of life in this world and abated not one jot of his devotion to those ideals even when the cross was the penalty for such devotion. The popular idea that Jesus died on the cross as a divine sacrifice finds no place in Unitarian belief. He is Leader rather than Saviour. Instead of believing that by his death he opens the way to a heaven above they believe that the ethical principles according to which Jesus lived point the way whereby man may make this world heavenly. Because the life of Jesus was a *man's* life, his gospel a *man's* gospel, Unitarians insist that it is a gospel which every man can and ought to live.

Unitarians believe in salvation as a purely human act, involving only human powers, the results of which are effective in changing the character of a man's life here in this world. A salvation which aims to bring about a change in the sentence which a "supreme judge" has already pronounced against the soul of a man, a salvation which seeks to save one from terrible penalties inflicted for eternity beyond the tomb, does not appeal to Unitarians as being helpful or in accord with the facts. They reject the idea that sin is purely or primarily an offense against God. Sin is moral and not theological in its nature. They cannot see how there is any sin in a man's disbelieving any or all the doctrines embodied in the church creeds. It may be indefensible to refuse to belong to a church and to participate in the great sacraments, but they decline to regard this as a violation of the moral law. According to their idea sin is wrong more or less deliberately committed by one person against another. Any word or thought or sentiment or deed which in any way works against moral and spiritual well-being, that is sin. From this it follows that the first and only step which a person can take toward salvation is not merely to strive to right the wrong but to so change himself and his plan of life that he will henceforth do right and desire and plan only to do right. Consequently Unitarians cannot think of salvation as a means of escaping the consequences of sin. A man must accept the consequences of his words, of his thoughts, of his deeds. From this there is no possible escape and ought not to be. A man enters the path of salvation only when he refuses to do or think or speak evil. And this every man, in a greater or less degree, is capable of doing. Unitarians reject the prevalent belief that man is *unable* to save himself, and so must needs plead his helplessness before a great supernatural saviour. They hold that by a continual struggle to master temptations and provocations from within and without a man can, and in no other way can he, become a *saved* man. In their judgment salvation is seldom a completed act. Few if any are wholly saved. The degree of salvation which a person enjoys is the measure of his triumph over injustice, greed, hatred and the thousand and one evils which beset a man in the world. In so far as ritual acts or belief in supernatural influence spur a man to righteous endeavor such play a part in his salvation. There is, so Unitarians believe, the power of salvation within every person. Every effort which a person makes toward rightness of life is this saving power in operation. The purpose of salvation, as Unitarians conceive it, is not to secure a place in a heaven beyond, but to secure an ever-increasing measure of heaven-likeness here.

What Unitarians believe concerning the future can easily be inferred from this. The idea of a "heavenly city" above and a "bottomless pit" below is dismissed by them as without warrant of fact; it has not even symbolic value. They have a "great hope" of future existence, but they stop short of expressing any definite knowledge concerning the *what* or the *where* of such existence. They hold as a hope, with some it is quite a positive belief, that the future can be nothing other than a continuance of this life. Unitarians generally feel quite sure that whatever happens after death, the soul that has lived its years on earth in sin will not, as a reward for certain theological beliefs, enter into a state of perfect bliss and holiness, neither will such a soul because of lack of such beliefs enter into a pit or state of horror and despair from which there is no escape. There is no great gulf of difference

separating the future from the present. The soul passes on with all the character it has won on earth unchanged. The idea of a soul being sentenced eternally to happiness or misery is rejected by Unitarians as being utterly unjust. Death does not determine the soul's character for all eternity. Death is not doom. If the soul lives on it is the belief of Unitarians that its continued existence must be amid conditions which allow of unceasing progress toward perfection or constant deterioration, as each soul shall elect. In the *life that is to be* as well as in *the life that now is* the soul must reap what it sows. An eminent Unitarian scholar well expresses the general Unitarian attitude in these words: "The doctrine of immortality is one in which Unitarians do not take a very acute interest. Their respect for human nature — their conviction as to the imperativeness of the moral law, their profound faith in the goodness of the earthly life as a part of the goodness of all life rightly understood — all these combine to fix their attention rather on this life than on the life after death.

The manner of compiling the existing canon of the Bible coupled with the fact that the men engaged in the task did not know more than the scholars of to-day makes it impossible for Unitarians to accept the belief that this book is God's inspired and infallible Word. The fact that there are in other religions scriptures believed to be inspired by deity and infallible takes from the idea that the Bible is a sacred book whatever distinction and authority such an idea is supposed to possess. Unitarians, however, hold the Bible in high esteem. They treasure it as one of the great, perhaps the greatest of the religious books of the world. And though they concede that it speaks with authority on some matters it is only the authority of the man who sees clearly and speaks accurately. So an utterance which has authority in the Bible would have no less authority if found in any other book. Nor is a thing true or *more* true because it is in the Bible. Whether in the Bible or out of it a thing is true only to the degree that it squares with knowledge and experience. To Unitarians the Bible is an inspiration, never a finality. It is read from Unitarian pulpits partly from custom, but most of all because it contains many passages of surpassing ethical beauty and inspiration, and usually only such passages are read. They use it in their Sunday schools because it deals with the history of a great people, and largely because it discloses the sources and character of many religious, political, ritualistic and ethical ideas which have shaped and directed Christian civilization. But Unitarians never lose sight of the fact that the Bible is distinctly a Hebrew rather than a Christian production. But that fact does not detract from nor add to its ethical and spiritual excellencies. From these excellencies Unitarians will continue to draw ethical and spiritual encouragement and illumination.

The Church according to the Unitarian understanding of things is a purely human institution. With all due respect to its traditions and appreciative of the good it has helped man to achieve, and wholly mindful of what in the way of spiritual comfort and strength it has been and is to many, Unitarians cannot ignore what seem so plainly to them to be the facts that the Church within Christianity is comprised of a series of churches each maintaining a separate existence by the imposition of fairly definite rules of exclusion. The idea that some one Church is the one and only true church does not seem to be warranted. Nor does the idea that there is somewhere within, behind, above existing churches a sort of true, mystic church of the Spirit, which will some day be established, appeal to them as having any force of truth. The Church is simply an organization of man's religious interests. The institution, no matter what its traditions and claims and forms, can have no authority above that which proceeds naturally from the intellectual and spiritual attainments of the persons composing it. Like every other institution it has a right to require that those seeking admission shall go through certain forms and pass a satisfactory examination on matters of belief, but to offer eternal rewards or pronounce eternal doom is wholly beyond its right and power. To belong to a church cannot secure any one a privileged position after death. The Church is a saving and righteous force in a community when and only to the extent that its members are living examples of purest and noblest character.

The rites of Baptism and the Lord's Supper are observed in many Unitarian churches, but Unitarians do not retain the old belief in these matters. They attach no serious importance to them. The idea that immersion or sprinkling or signing with the cross with water upon adults or babes can effect any spiritual regeneration or in any way change the relation between a human being and deity is rejected. Ritual or Sacrament can, in their judgment, possess no saving power. In Unitarian practice "baptism" is generally spoken of as "consecration." The purpose of the service of consecration of children is to express the parents' desire that the children shall grow up into purity of life and nobility of service. The same idea is carried out in the consecration of those of "riper years." It is a consecration of life "to God and his truth and to the service of your fellowmen." The observance of the Lord's Supper is found only in the older Unitarian churches, and in these its observance tends to gradually disappear. Where it is most regularly observed the sacramental idea is wholly eliminated. The form is retained as is some of the old phraseology which conveys the ancient belief that the communicants are partaking of a sacrifice, but the idea is wholly foreign to Unitarian thought. What Unitarians have in mind is in the nature of a memorial service recalling the life of the Master. The tendency to abandon it altogether is due to the fact that it is exceedingly difficult to avoid being misunderstood. An ancient ritual is a poor medium through which to convey modern ideas. The idea that great spiritual merits are obtained by this or any sacrament is not accepted by Unitarians, but they believe that in so far as observing the Lord's Supper inspires a passionate love of the character and work of Jesus it is good.

The one purpose of real religion, Unitarians believe, is not to prepare people for another life, but to inspire them to live this

as it ought to be lived. This explains why Unitarians have been most conspicuous in all enterprises which aim to improve the general well-being, morally, intellectually and even materially. Thus it happens that in an unusually large number of instances Unitarians have been pioneers in philanthropic and educational enterprises and have been pre-eminent in literature. A few instances may be quoted. The founder of the Perkins Institute for the Blind in Boston, a pioneer movement, was Dr. Samuel G. Howe, and to Dorothea Dix must be given credit for starting the movement which resulted in a more humane treatment of those in prisons, in almshouses and hospitals for the insane. A Unitarian layman, Henry Bergh, was the founder of the Society for the Prevention of Cruelty to Animals. The first woman advocate of the "rights of women" in the United States, Margaret Fuller, was a Unitarian, and conspicuous in this movement have been such women as Julia Ward Howe, Elizabeth Cady Stanton and Susan B. Anthony, all of them Unitarians. Horace Mann, pioneer in educational reform, was a Unitarian layman, and Henry Barnard writes that "had it not been for Cyrus Peirce (Unitarian minister) I consider the cause of Normal schools would have failed or been postponed for an indefinite period." Peter Cooper, founder of Cooper Union in New York City, was an earnest Unitarian. The first library in the United States that was free to all the inhabitants of a town or city was opened in Dublin, N. H., by the Unitarian minister of that place, the Rev. L. W. Leonard; and in the adjoining town of Peterborough, under the leadership of the Unitarian minister, the Rev. Abiel Abbott, the people voted to tax themselves to maintain a library—the first library in the country supported from the tax rate of a municipality. The United States Sanitary Commission, which did such splendid service in the Civil War, was originated by the Rev. Henry W. Bellows, minister of the Unitarian Church of All Souls in New York City. This devotion to humanitarian work is not accidental, it is Unitarian religion, and in their churches emphasis has been and is always put upon the religion of service, making the most and the best of this life.

This goes to explain how it comes to pass that Unitarians have been so conspicuous in literature, statesmanship, in the judiciary and elsewhere. The Unitarian representation in literature is out of all proportion to the size of the denomination. In American literature Unitarians are represented by Henry W. Longfellow, Oliver Wendell Holmes, Ralph Waldo Emerson, James Russell Lowell, William Cullen Bryant, Bayard Taylor, Nathaniel Hawthorne, Thomas Wentworth Higginson, William D. Howells, Bret Harte, Louise M. Alcott. Among historians, Bancroft, Prescott, Motley and Parkman might be mentioned. Thomas Jefferson was an outspoken advocate of Unitarianism. John Adams and John Q. Adams, Millard Fillmore and William H. Taft are among the men of this faith who have occupied the Presidency of the United States. John Marshall, Charles Sumner and Daniel Webster were also Unitarian laymen. The list is a long one and is referred to only to indicate the character of Unitarianism through the type of men and women who have been identified with it.

Unitarian contributions to hymnology are out of all proportion to the size of the denomination, and the quality of those contributions is second to none. The catholicity of their spirit and the excellence of their devotional and spiritual character are evident from the wide approval which many Unitarian hymns have received. There is hardly a hymnbook of importance which does not contain a number. See HYMNOLOGY.

Bibliography.— The material for this subject is voluminous, particularly on the subject of Unitarian belief. There is no one formal statement which has more authority than another. An excellent presentation is contained in the article by Prof. F. G. Christie in *American Journal of Theology*, 17 Oct. 1918; consult also Savage, Minot J., 'Pillars of the Temple'; Chadwick, John White, 'Old and New Unitarian Belief'; Emerton, Ephraim, 'Unitarian Thought'; Martineau, James, 'The Seat of Authority in Religion'; the sermons and addresses of W. E. Channing, Theodore Parker, R. W. Emerson and M. J. Savage, and pamphlets issued by the American Unitarian Association.

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UNITED AMERICAN MECHANICS, Junior Order of, a fraternal and beneficial organization founded in 1853. In 1910 it had a membership of 210,000, with 33 State councils and 2,400 subordinate councils. In the same year the order paid benefits to the amount of $760,000. Its membership is now (1918) slightly increased.

UNITED AMERICAN MECHANICS, Order of, a fraternal and beneficial organization founded in 1845. In 1910 it had a total membership of 46,217, with 18 State councils and 676 subordinate councils. In the same year the order paid benefits amounting to $112,775. It is the parent of the Junior Order.

UNITED ARMENIANS, a branch of the Catholic Church in communion with the See of Rome, but retaining the liturgy and ritual of the ancient Armenian Church; they are estimated to number 150,000 souls. In 1830 Pius VIII nominated a primate for the United Armenians of European Turkey, and as accessions from the Schismatical Armenian Church grew numerous, six suffragan episcopal sees were created 1850. In resentment of the Pope's intervention in the election of their patriarch in 1870 a schism arose and the United Armenian Church lost upward of 4,000 members; the seceders were excom-

municated by the Pope, but they elected a patriarch of their own and came into possession of most of the church property. The schismatical patriarch in 1879 renewed his obedience to Rome, and his example was followed by many of the clergy and people. The United Armenians live in the Balkans and Turkey and in the Ukraine and south Austria.

UNITED BAPTISTS, a religious sect in the United States which had its rise in the middle of the 18th century during the great revival of religion under the ministrations of George Whitefield. Owing to differences of opinion among Baptists as to the methods of the revivalists some of them seceded from the churches and were called Separates, while those who remained were distinguished as Regulars; the Separates approved the "new measures," the Regulars condemned them. After a time some members of both factions came together and took the name of United Baptists. Their articles of belief declared that Christ died to make atonement for sin; that sinners freely choose their condition; that baptism should be administered to believers only, and by immersion; and that foot-washing ought to be practised by all baptized believers. The sect exists chiefly in the southwestern States. In 1917 it had in the United States about 250 ministers, 200 churches and 13,000 communicants.

UNITED BRETHREN, called also **MORAVIANS,** a religious sect or society, the *Unitas Fratrum*, the membership of which was made up at first of Moravians or Bohemians, descendants of the first followers of John Huss (q.v.). A party of Moravians or Hussites, fleeing from persecution in their native countries, were, 1722, permitted by the Count von Zinzendorf (q.v.) to settle on his estate, Berthelsdorf in Saxony. Berthelsdorf, new-named Herrnhut, has ever since been the principal seat of the society; hence the name Herrnhuters by which they are known in Germany. Their patron devoted his whole estate to the propagation of Christianity through the ministrations of the Brethren and was the society's chief director and most zealous missioner and evangelist till his death. In Germany they are recognized by the several governments as Protestants attached to the Confession of Augsburg; but they claim for their bishops apostolic succession through the Waldensian Church; their bishops, however, exercise no jurisdiction, their principal function being that of conferring ministerial order. Every congregation is governed by a board of trustees and a board of elders; the whole society or church is governed by synods composed of bishops and deputies of clergy and laity; in the intervals between synods the affairs of the Unitas Fratrum are managed by a conference of elders. There are communities and settlements of the United Brethren in various Christian countries, as Germany, Holland, Britain, North America and in heathen lands. The Brethren early entered the field of foreign missionary labor, and though numerically the society is not to be compared with the other religious bodies which are represented in that work, it has perhaps the most complete missionary organization in the world. The island of Saint Thomas in the West Indies was the first field of their missionary zeal 1732; the following year they planted a mission in Greenland, the fruits of which have been most abundant; their missionary stations are found also in South Africa, Tibet, Labrador, Alaska and other heathen countries. In 1740 the first communities of the United Brethren were established in Pennsylvania, and in that colony they founded the three towns, Bethlehem, Nazareth and Lititz. From these centres went forth a large number of devoted Christian men and women who labored with great success among the colonists and the various Indian tribes. At present the American province of the Moravian Church or Unitas Fratrum is divided into two districts, the northern district with its seat at Bethlehem, Pa., the southern with its seat at Salem, N. C. Each of these districts has its own synod. In 1917 the Unitas Fratrum or Moravian Church had in the United States 144 ministers, 126 churches and 20,859 communicants. The Union Bohemians and Moravians had in addition for ministers, 21 churches and 1,000 communicants.

UNITED BRETHREN OF CHRIST, a denomination of Evangelical Christians which, though not organized and named till 1800, had its origin in 1766 during a revival of religion among the immigrant German population of Pennsylvania and northern Maryland under the ministrations of Philip William Otterbein, a missionary of the German Reformed Church, and Martin Boehm, a minister of the Mennonite sect. By these leaders preachers were licensed and conferences assembled, but not until 1800 did the movement take the form of a church or assume a distinctive title; in that year at a conference held in Frederick County, Md., the title of United Brethren in Christ was assumed and Otterbein and Boehm were chosen bishops. The sect is in no wise related either to the Unitas Fratrum, though that society is also officially styled United Brethren; nor to Methodism. Otterbein and Boehm were preaching the distinctive doctrines of the United Brethren in Christ before there were any Methodists in this country. The theology of the church is Armenian; its form of worship is simple, marked by congregational singing and participation of all members, male and female, in the devotional exercises. The ministers are appointed to their charges by the bishop and presiding elders at an annual conference; the time limit of the pastoral relation is three years, but may be extended indefinitely by consent of the conference. Since 1889 women are admitted to the ministry on the same terms as men. Originally the religious services were conducted in the German language: at present only in a small number of the churches is that language employed. The church has a theological seminary and a publishing house at Dayton, Ohio, and in other places nine colleges and several academies. Its missionary society conducts home missions, also missions in Germany and in South Africa. In 1917 the number of ministers of this church in the United States was 1,937, of churches 3,577, of communicants 345,705. Through a schism in 1889 the church lost a portion of its membership, and the seceders formed a separate organization called United Brethren (Old Constitution). This body had in 1917 310 ministers, 515 churches and 21,172 communicants, this being a falling off of over 28,000 communicants in seven years. Presumably many of them re-

turned to the parent body, which gained over 60,000 in the same period.

UNITED CHRISTIANS OF SAINT THOMAS, those of the native Christians of Malabar and Travancor who are in communion with the Roman See. The Christian Church of Malabar, called the Church of the Christians of Saint Thomas, dates from an early period, perhaps the 6th century, and appears to have from the beginning been in communion with the patriarch of the Nestorians. At the close of the 16th century, under Portuguese domination, this church was brought into communion with Rome. When the Dutch succeeded the Portuguese, the Christians of Saint Thomas renounced the union with Rome, and receiving a metropolitan from the Jacobite patriarch of Jerusalem, adopted the creed and liturgy of the Monophysites; the direct opposite of their original Nestorianism. Throughout these changes a minority of the Christians of Saint Thomas adhered to Rome, and these, with later secessions from the schismatical Jacobite church, number about 100,000, subject to a vicar-apostolic appointed by the Pope. They use the Syriac liturgy of the Nestorians, not that of the Jacobites.

UNITED COPTS, the small body of seceders from the Monophysite Coptic Church who acknowledge the supremacy of the Pope and are in communion with the See of Rome. The church of the United Copts uses the rite of the Monophysite Coptic Church and retains many of the peculiarities of that church in matters of discipline. The United Copts are presided over by a vicar-apostolic appointed by the Sovereign Pontiff.

UNITED DAUGHTERS OF THE CONFEDERACY, a social, literary, historical, monumental and benevolent association, composed of the widows, wives, mothers, sisters and lineal descendants of men who rendered honorable servic in the army and navy of the Confederate States, or who served in the civil service of the Confederacy, or of any of the States embraced therein, or who gave personal service to the Confederate cause. It was organized at Nashville, Tenn., 10 Sept. 1894, Mrs. M. C. Goodlett, of that city, being the prime mover. In recognition of this service Mrs. Goodlett was subsequently made a permanent official of the organization, with the title of honorary president and founder. The organization has 555 chapters, located in all parts of the United States, and has a total membership of 26,227.

UNITED EVANGELICAL CHURCH, a religious body formed in 1894 by division from the Evangelical Association. The first general conference was held that year at Naperville, Ill., at which the necessary legislation was enacted, and a book of discipline drawn up and adopted. In 1918 the United Evangelical Church had about 1,000 organized congregations, 2 bishops, 550 preachers, 90,000 enrolled members and about an equal number of pupils in Sunday schools. Its mission society maintains missions in Hu-Nan, China; about $100,000 being the annual expenditure of the church for missions. Educational institutions under control of this denomination are Albright College, Meyerstown, Pa., Dallas College and La Creole Academy, Dallas, Ore., and Western Union College at Le Mars, Iowa. It issues *The Evangelical* (weekly), *The Missionary Tidings* and *Die Evangelische Zeitschrift,* all at Harrisburg, Pa. Consult Stapleton, Ammon, 'Annals of the Evangelical Association of North America and History of the United Evangelical Church' (Harrisburg 1900).

UNITED FREE CHURCH METHODISTS, a religious body in Great Britain formed by the amalgamation of two subdivisions of Wesleyanism, namely, The Wesleyan Association which had its rise in 1834 when, upon the removal of one or two influential ministers from the original connection, there resulted a secession; and the Wesleyan Reform Association, another body of seceders from the parent body, in 1849; this secession was caused by the expulsion of several ministers from the Wesleyan Church on charge of insubordination. Soon these two seceding bodies entered into a union as United Free Church Methodists; 40 years after the union of the two bodies the United Methodist Free Church had over 85,000 members, 409 ministers and nearly 3,500 local preachers.

UNITED FREE CHURCH OF SCOTLAND, the name assumed by the ecclesiastical body formed 31 Oct. 1900 by the union of the Free Church of Scotland (q.v.) with the United Presbyterian Church of the same country. The Free Church contributed to the union 1,077 congregations, and the Presbyterians 599 congregations. Three divinity halls (or seminaries) exist, at Glasgow, Aberdeen and Edinburgh.

UNITED GREEKS. See GREEK RELIGION.

UNITED IRISHMEN, a society for political reform founded in Belfast 1794; its aim was to promote union among all the people of Ireland without distinction of creed, for the preservation of their liberties and the extension of their commerce. At that time two-thirds of the people of Ireland, the Catholics, were by law excluded from all participation in the government of their country. The first society of United Irishmen consisted wholly of citizens of Belfast, respectable merchants and professional men, all of them Protestants or Presbyterians. The same year a branch society was formed in Dublin, and soon the Dublin society was recognized as the central directing body. In its membership were comprised many young men representative of the best elements of society — scions of ancient houses Anglo-Irish or Celtic, some prosperous Dublin merchants, and many young professional men who after the misfortunes of 1798 rose to eminent distinction in their own country, in France, or in the United States, without recanting any of the principles of the United Irishmen. At first the society was constitutional and not secret: it was made a secret society in 1795, and steps were taken for the enrolment of men preparatory to a general insurrection when the promised aid in men and material should arrive from France. At the close of 1796 there were reported as enrolled 500,000 men, sworn members of the society, of whom 100,000 were more or less provided with arms — muskets and pikes. In the mean-

time Theobald Wolfe Tone, Arthur O'Connor, Lord Edward Fitzgerald, and other agents of the society had been busy in France, and the Directory had given them assurance that aid would be forthcoming. On 16 Dec. 1796 a fleet of 17 sail of the line, 13 frigates and 13 smaller ships bearing 15,000 French troops sailed for Ireland from Brest, commanded by General Hoche, Grouchy second in command; this expedition, defeated by continuous violent storms, had to return home without effecting a landing in Ireland. In the spring of 1797 adverse winds prevailing for weeks prevented the sailing of a joint expedition of troops of the French and Batavian republics for Ireland. Bonaparte's armée d'Angleterre was made an "army of Egypt" in the spring of 1798, and the long-planned insurrection in Ireland, started without any prospect of aid from France, met with inevitable defeat. After suppression of the insurrection, which was confined to three of the 32 counties, by an armed force of 137,000 men, the chief leaders of the United Irishmen in Dublin and Belfast were first confined in a fortress for four years and then banished; very many of the exiles settled in the United States. Of the 20 leaders confined in Fort George the religious affiliations were: Episcopalians, 10; Presbyterians, 6; Catholics, 4. Though the society was secret the constitution and oath were published. Consult Plowden, 'History of Ireland' (Philadelphia 1806).

UNITED KINGDOM. See GREAT BRITAIN.

UNITED MINE WORKERS OF AMERICA, The, the largest labor union in America, having for its object the union of all mine "employees that produce or handle coal or coke in or around the mines, and to ameliorate their condition by means of conciliation, arbitration or strikes." The National Executive Board levies assessments and orders strikes by a two-thirds vote. This board consists of the president, vice-president and secretary and 29 delegates — one from each district into which the national jurisdiction is divided. Fraternal benefits do not figure largely in this union, which expends most of its revenue in supporting strikes. In most of the great coal regions the union has secured recognition from the operators of the principle of collective bargaining and with the latter fix yearly a scale for the succeeding 12 months. The union was organized 25 Jan. 1890, but it made little headway until the great strike of 1897, in which year its membership for the first time passed the 9,000 mark. Within the last 20 years the membership has grown to 420,000 men, divided into 29 districts and over 3,000 locals. The official organ of the union is the *United Mine Worker* (Indianapolis, weekly). Biennial conventions are held and proceedings published. In November 1917 wages, hours and conditions of labor were regulated by a contract made in Washington, which was to last until 31 March 1920, or "until the expiration of the war."

On 23 Sept. 1919 the United Mine Workers' Convention at Cleveland declared that this contract had expired because of the virtual ending of the war on 11 Nov. 1918. The convention on the same day adopted a resolution demanding an increase of 60 per cent in wages, a six-hour day and a five-day week and authorizing the international officials to call a strike, effective 1 November, if a satisfactory agreement had not been negotiated by that date. On 17 October Secretary Wilson of the Department of Labor conferred with President Lewis of the miners and T. T. Brewster, chairman of the operators' association, in Washington. This conference was futile, as was also a joint conference of miners and operators, called by Secretary Wilson, lasting from 21 to 24 October.

President Wilson issued a statement on 25 October, demanding the recall of the coal-mine strike order and declaring that a "strike under those circumstances is not only unjustifiable, but unlawful." On petition of the government United States Judge Anderson on 31 October issued a temporary restraining order to prevent miners' officials from doing anything in furtherance of the strike. On 8 November a temporary injunction was granted and a mandatory order issued requiring the rescinding of the strike order. Meantime the bituminous miners walked out and production in all union mines ceased. Secretary of Labor Wilson again called the miners and operators to Washington and on 21 November offered as a compromise that an increase of 31 per cent be granted the miners. A few days later, after this had been considered by the Cabinet, Fuel Administrator Garfield proposed an increase of 14 per cent, without any increase in the price of coal to the public. This was rejected by the mine workers.

President Lewis and Secretary-Treasurer Green conferred on 6 December with the Attorney-General of the United States and it was later announced that an agreement had been reached, based on the proposal of President Wilson made on 5 December. Under this plan the miners were to return to work at once; were to receive a 14 per cent increase in wages; after resumption of work the President would appoint a commission of three — one operator, one miner and one representative of the public — to investigate and determine, if possible within 60 days, a basis for a new wage agreement. The miners' representatives after several days' discussion accepted the proposal on 9 Dec. 1919, and on the same day the strike was called off.

UNITED PRESBYTERIAN CHURCH OF NORTH AMERICA. See PRESBYTERIAN CHURCH IN UNITED STATES OF AMERICA.

UNITED PROVINCES OF AGRA (ä'gra) **AND OUDH,** owd (formerly the NORTHWEST PROVINCES and OUDH), British India, a province in the north central part of India, bounded on the north by Tibet and Nepal, on the east by Bengal, on the south by the states of the Central India Agency and on the west by the Rajputana and the Punjab. It consists of Agra (formerly the Northwest Provinces), 83,198 square miles; Oudh, 23,966 square miles; and the native states of Rampur, 899 square miles; and Garhwal, 4,180 square miles. Total area under British administration, 107,164 square miles; grand total, 112,243 square miles. Pop. (1911): Agra, 34,624,040; Oudh, 12,558,004; Rampur, 531,217; Tehri, 300,819; total, British province, 47,182,044; total, including native states, 48,014,080. The city of Agra has 185,449 population. See AGRA; OUDH.

UNITED SECESSION CHURCH. See PRESBYTERIANISM.

UNITED STATES, a federal republic composed of States, Territories, one district and colonies (see BOUNDARIES, ETC.). The official title is "The United States of America." Used in the singular "The United States" is in general acceptance as the name of the country; and its citizens are universally known as "Americans" to the exclusion of all other inhabitants of the Western Continents. The Republic originated in the rebellion of the British colonies of North America, Canada excepted, in 1776, and in the Declaration of Independence the 13 colonies in revolt styled themselves "The Thirteen United States of America." In the present work the order and scope of the articles on the United States are indicated by the following main topics:

1. Boundaries, etc.
2. General Outline History (1776–1920).
3. Causes of the Revolution.
4. The American Revolution (Military Events).
5. The Declaration of Independence.
6. The American Revolution (Diplomatic Conditions during the War and the Peace Negotiations).
7. Articles of Confederation.
8. The Formation of State Constitutions.
9. The Peopling of the United States.
10. Finances (1775–1789).
11. The Federal Convention of 1787.
12. Beginnings of Party Organization and Growth of the Party System and Party Machinery.
13. The Colonial and Territorial Systems.
14. The Cabinet.
15. The Alien and Sedition Laws.
16. The Judiciary.
17. Diplomacy.
18. The War with France.
19. The Louisiana Purchase.
20. Causes of the War of 1812.
21. The War of 1812.
22. Finances (1789–1816).
23. Westward Movement.
24. The New Democracy and the Spoils System.
25. Annexation of Texas.
26. The Abolition and Free Soil Movements.
27. The Mexican War.
28. Slavery.
29. Finances (1816–1861).
30. Efforts to Settle the Slavery Question.
31. Causes of the Civil War.
32. Secession.
33. Military Events of the Civil War.
34. The Confederacy.
35. The Political Events of the Civil War.
36. Finances (1861–1919).
37. Reconstruction.
38. The Thirteenth, Fourteenth and Fifteenth Amendments to the Constitution.
39. The War with Spain.
40. Territorial Expansion.
41. State Constitutions.
42. Immigration (1789–1916).
43. Suffrage.
44. Civil and Religious Liberty.
45. Disputed Elections.
46. Impeachment.
47. The President's Office.
48. The Vice-Presidency.
49. Speaker of the House of Representatives.
50. History of Arbitration.
51. Growth and Development of Law.
52. Railroad Transportation.
53. Foreign Commerce.
54. Industrial and Commercial Development.
55. Army of the United States.
56. Navy of the United States.
57. Chronological History of the United States Navy.
58. Political Parties.
59. Foreign Policy.
60. The United States and the European War.

Appended to these articles will be found adequate cross references to much material which has been singled out for more extensive treatment under separate headings.

1. BOUNDARIES, ETC. The main portion of the United States occupies the middle part of North America extending approximately from 24° 20′ to 49° north latitude, and from 66° 48′ to 124° 32′ west longitude. The northern boundary line beginning with the Pacific Ocean is as follows: The fixed line running about southeast in the Strait of Juan de Fuca, midway between the State of Washington and Vancouver Island, to Puget Sound, then north, and northeast, to the Strait of Georgia, then northwest to the 49th parallel; from thence east to the Lake of the Woods; thence along the southern coast of the Lake of the Woods, continuing along Rainy River, through the middle of Rainy Lake, and several other lakes which are expansions of Rainy River, to Lake Superior, north on the northwestern coast of Lake Superior to Port Arthur. From Port Arthur the line continues east through the Great Lakes (except Michigan) and the rivers or straits connecting them, to the Saint Lawrence River; thence about midway to the 45th parallel; thence along the 45th parallel east to Hall's Stream; thence north by east, along Hall's Stream nearly to the 46th parallel; then an irregular highland boundary to the Maine State line; thence along highland lines and the southwest branch of the Saint John River to 46° 45′; thence north 47° 20′; thence northwest to the extreme northerly boundary of Maine. From this point the boundary is along several small lakes and streams tributary to the Saint John; thence along the Saint John to the New Brunswick boundary and south in a straight line to the head of Saint Croix River; thence along the Saint Croix River, Grand Lakes and through Passamaquoddy Bay to the Atlantic Ocean. The southern boundary line between the United States and Mexico is as follows: Beginning at the point on the Pacific Coast at 32° it extends east to the Colorado River, south 20 miles along the Colorado, southeast to 31° 20′ north latitude and 111° west longitude, east along the line of 31° 20′ for 160 miles; thence north to latitude 31° 47′; thence east to the Rio Grande, and along the Rio Grande southeast, east and southwest to the Gulf of Mexico. The remaining portion of the southern boundary is defined by the northern and eastern shore line of the Gulf of Mexico; the eastern boundary by the Atlantic Ocean and the western boundary by the Pacific Ocean. The Canadian boundary line is 3,900 miles long; the Mexican boundary line is 1,975 miles long, and the total ocean, lake and river boundary is 10,758 miles. The greatest length, from the Atlantic to the Pacific, is 3,100 miles and north and south 1,780 miles. Alaska (q.v.), in the northern part of North America; Hawaii (q.v.), in the Pacific Ocean; Porto Rico (q.v.) and the Virgin Islands in the Atlantic Ocean; the Philippines (q.v.), and several small islands in the Pacific (parts of the eastern hemisphere), are all included within the United States. The area of the main portion of the United States is 3,026,789 square miles. The area of Alaska is 590,884 square miles; of the Philippines 115,026; Porto Rico, 3,604; Hawaii, 6,449; Panama Canal Zone (leased), 436; Virgin Islands, 149; Tutuila and Samoa, 55; Guam, 210; making a total of 3,743,518 square miles.

Coast Lines.— The coast line is comparatively regular; there are no large indentations, but the largest and most numerous are on the Atlantic Coast. The principal arms of the sea on the Atlantic are Chesapeake, Delaware, New York, Massachusetts and Cape Cod bays, and Long Island, Albemarle and Pamlico sounds. On the coast of the Gulf of Mexico are Mobile, Galveston and Tampa bays; and on the Pacific Coast San Francisco Bay, Bay of Monterey, Puget Sound and Santa Barbara and San Pedro channels. (For coast lines of Alaska and the island possessions see articles on ALASKA; GUAM; HAWAII; PANAMA CANAL; SAMOA; VIRGIN ISLANDS, etc.). There are no large islands off the coast of the main portion of the United States. Long Island (q.v.) is the largest; the next important are the islands off the northeast Atlantic Coast and

the Santa Barbara (q.v.) group off the southwest Pacific Coast. Florida in the southeast is the largest peninsula. There are more good harbors on the Atlantic Coast than on the Pacific or Gulf coasts. The Atlantic Coast differs widely in character in the north and south. In Maine, New Hampshire and northern Massachusetts it is very rocky, with rocky headlands jutting far into the sea and with numerous rocky islets. From Boston southward the coast is low and sandy, with numerous sandbars, back of which are swamps and lagoons. The latter is especially true of the North Carolina and Virginia coasts. The Dismal Swamp is the largest depression of this kind. The rivers of this coast have tidal estuaries. The Gulf Coast is also low and sandy and in places extremely dangerous to navigation because of sandbars. The character of the Pacific Coast is very simple, there being an almost straight unbroken front to the sea throughout its length. With its indentations the Atlantic Coast line has an estimated total length of 12,350 miles; the Gulf Coast, 5,725 miles, and the Pacific Coast, 3,250 miles.

Topography.— The main part of the United States presents four physical divisions: two elevated and two lowland regions. The elevated are the Appalachian Mountains (q.v.) in the east and the Rocky Mountains (q.v.) or Cordilleran system in the west. The eastern lowland mass is along the Atlantic Coast, broad at the Gulf of Mexico and narrowing toward the north where the mountains are but a short distance from the ocean. The southern part of the Atlantic lowlands joins the central lowland region south of the Appalachian Mountains and about 70 miles from the Gulf of Mexico. It is much less in extent than the central lowland division but it contains a large population, is the oldest portion settled by Europeans and was the chief battle ground in the war for American independence. The northern and southern parts of this lowland section differ materially in formation and soil. The mountains in the northern part approach the ocean so that the foot-hills are almost at the sea line; the lowlands are in some places really series of low hills, masses of rocks, sandy soil, large areas covered deep with glacial deposits and with masses of rock formation which show the marks of mighty ice-forces. Beginning with and including the southern portions of New Jersey, and continuing to the Gulf and Florida Strait, is a plain of low, almost level, land, extending in a gradual slope from the mountains to tide water. The soil and climate contribute to the extensive growth of fruits, tobacco, corn and cotton. The northern section of the Atlantic lowland is a worn-down mountain region and the southern section at no ancient period was sea-bottom and even now the line of demarcation between the coastal plain and the continental shelf is very slight in many places. This section has received the name of "Tide Water Country," on account of its being a gift to the continent from the sea, and also because many of its rivers are tidal streams for some distance from the ocean. The central lowland lies between and on the lower slopes of the two great uplifts. It is called the Mississippi Valley on account of the greater portion being in the basin of the Mississippi River. The higher slopes, merging into the foot-hill reglon of the Appalachian on the east and the Pacific on the west, become the plateau lands. The so-called Piedmont Plateau lies west and northwest of the central part of the great Atlantic lowlands or plains. The whole plateau seems not to have been brought down to the level of the sea, but to have inclined slightly to seaward and toward the valleys of the streams; so that, in reference to its plain condition, the region is often called a peneplain. When the land portions of the Atlantic lowland was raised above sea-level the same system of upheaval extended throughout the Piedmont region, and has continued with intermission to the present time, until the old plains have now reached an altitude which constitutes them a plateau as now understood. The plateau is bounded on the northwest by the Appalachian Mountains. It was not upheaved evenly and simultaneously in all its parts. Where first lifted, the gorges and valleys are convex; where last lifted they have concave profiles. The large grassy, almost treeless areas in this section are called prairies. This great lowland region of the United States is a part of the central lowland section of North America, which is called, in Canada, the Hudson Bay and Mackenzie regions. In the southern part of this section are vast areas of flood plains, and also land which at no very remote period was wholly under water. Beginning with the Atlantic plain or lowland at Florida, extending west and including the southern part of the central lowland section, there are broad areas only a few feet above sea-level, in many places less than 100 feet. The northern part of this central section is bounded by the Great Lakes. The divide between the streams that flow into the Great Lakes and those which flow into the Gulf of Mexico, by way of the Mississippi, is very slight. The three long slopes in this division are the one from the northern part to the Gulf; the one from the Appalachian divide on the east to the Mississippi; and the third from the Rocky Mountain divide on the west to the Mississippi. There are numerous sandbars and swamp lands along the southern coast. The eastern slope is shorter and less steep as a whole than the western slope. There are high bluffs along many of the rivers of the western part, even in sections where there are large areas of rolling prairie lands. The huge boulders and mountain peaks of the northwest section seem like outposts on the beginning of the plateau region. In the southwest the lowlands extend around the southern part of many of the mountain chains, so that the greater part of the United States south of the low rocky hills which form the extremity of the Appalachian Mountains, and extending west to the Guadalupe Mountains, is one continuous lowland mass. The mountains in Missouri and Arkansas, south of the Missouri River and just west of the Mississippi, are the most important highlands in this whole section. In Missouri these highlands are called Ozark Mountains or Ozark Plateau, in Arkansas Ouachita Mountains.

Along the Pacific Coast is a narrow strip of low land of not sufficient extent to be classed among the great physical divisions, but of great value from an economic point of view. The southern part of this lowland border is considerably wider than that of the northern part.

The numerous parallel valleys, in some places valley arms, which are on the eastern border of the Pacific lowland strip, furnish a considerable area of productive farm lands.

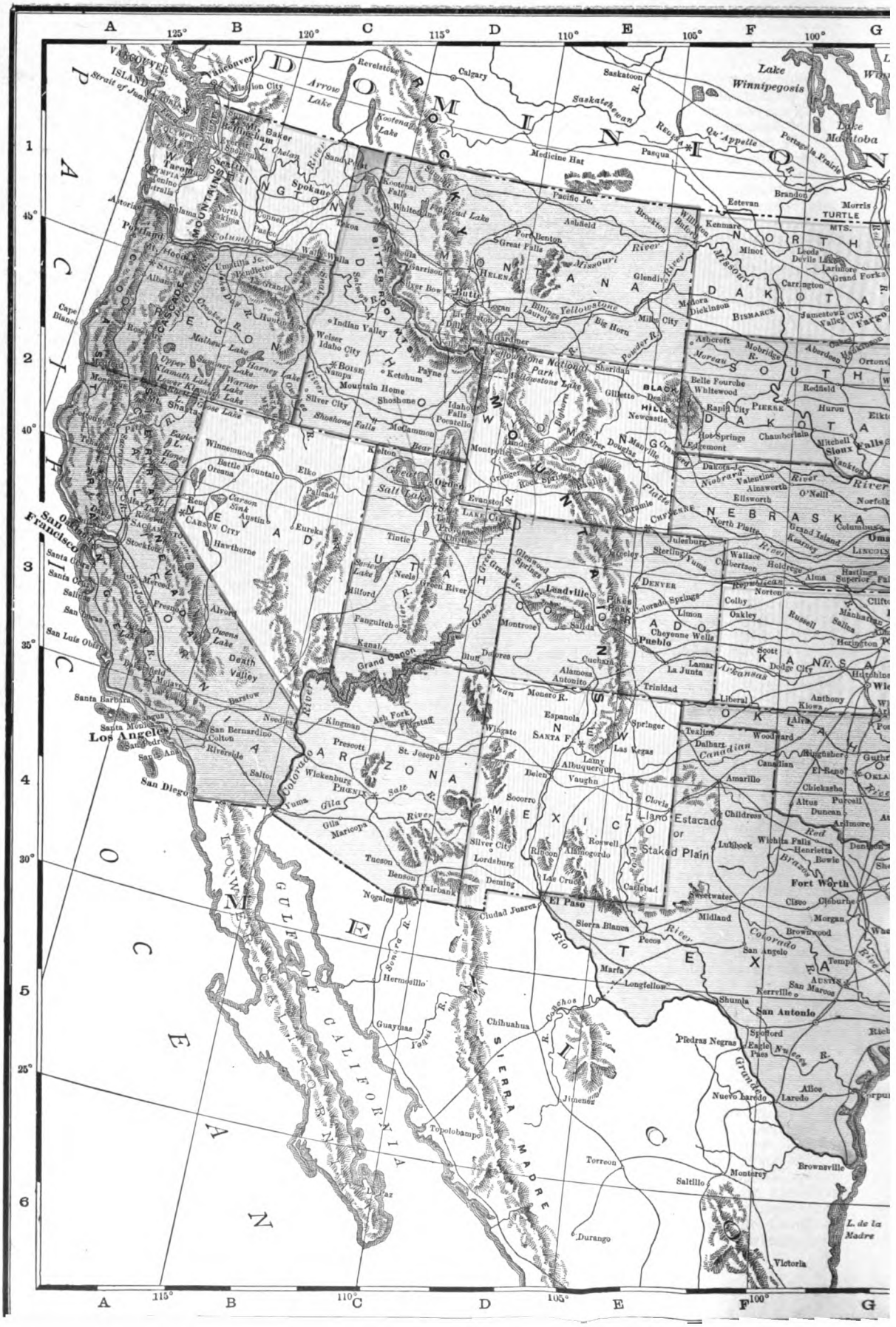
The eastern uplift, the Appalachian Mountains, are the older and less extensive of the two great highland sections of the United States. (See APPALACHIAN MOUNTAINS). They consist chiefly of mountain ranges which are nearly parallel with the Atlantic Coast and extend from near the Gulf of Mexico north into Canada. Nearly all of the western part of the United States, beginning about the 104th meridian, belongs to the Rocky Mountain region. (See ROCKY MOUNTAINS). This portion of the United States has a greater altitude and extent than the mountain lands of the Atlantic region. The Rocky Mountains extend from Mexico to Canada. The ranges which constitute this group are by no means as regular in arrangement as are the Appalachian chains; some extend nearly parallel with the coast; many lofty ranges are at almost right angles with the north and south ranges and others run northeast and southwest. Enclosed by ranges of these mountains are the Great Basin (q.v.) and the Yellowstone Park (q.v.). The Great Basin region is a series of basins isolated to all appearances from each other so far as drainage lines, and differing in soil and geological formation. The chief basins are the Carson, Humboldt and Great Salt Lake. The mountain ranges within the Great Basin trend mostly north and south. The vast area of the volcanic region of the Rocky Mountains contains many extinct volcanoes. On both the eastern and western border are numerous high peaks connected by high plateaus. In the southern part or the portion drained by the Colorado River is a region of high plateaus crossed by streams which flow through deep cañons, some of which are over 2,000 feet deep. The Grand Canyon (q.v.) of the Colorado is in places 6,000 feet deep.

Hydrography.— The United States may be divided into four great drainage slopes,— the Atlantic, Great Lake, Gulf and Pacific — although the second and third of these belong broadly speaking to the Atlantic. All the streams of the Atlantic slope drain into that ocean by river mouths within the territory of the United States. All the streams of the Great Lake slope ultimately discharge into the Saint Lawrence River, also within the territorial limits of the United States. The Gulf slope includes all of that part of the United States which drains into the Gulf of Mexico. In popular usage, most of this is called the valley of the Mississippi, while small areas are drained into the Gulf by streams not tributary to the great river. East of the Mississippi this slope is drained by the Apalachicola, Mobile and Pearl, and to the west by the Sabine, Brazos, Colorado, San Antonio, Nueces and Rio Grande. Along the western border of the Gulf slope the country is arid, having a rainfall of less than 20 inches annually. In this arid region there are many small streams whose waters are not carried away by ocean-feeding rivers, as the small streams are lost in the sands. On the Pacific slope all streams that ultimately reach the sea do so within the territorial limits of the United States, but the district drained by the Colorado River of the West reaches the Gulf of California by passing a short distance through Mexican territory. In a large part of the Pacific slope there are many small streams that discharge their waters into sands, where they are evaporated and lost from the ocean-reaching drainage; but the valleys in which they are evaporated incline toward streams draining into the Pacific Ocean. We thus have an Atlantic slope, a Great Lake slope, a Gulf slope and a Pacific slope. The lines of demarcation between these slopes are very irregular. Between the Atlantic and the Great Lake slopes the divides are sometimes in mountains and sometimes in hills; between the Atlantic and Gulf the divides are in part in mountains and in part along the low ridge of Florida; between the Gulf and Great Lake slopes the divide is an inconspicuous elevation, so low in many places that the waters may easily be diverted from one slope to another. The divide between the Mississippi region and the Pacific region is sometimes mountains, with peaks from 8,000 to 14,000 feet above sea-level. Of the large river systems the chief are the Mississippi, the Saint Lawrence, the Columbia and the Colorado. The Mississippi (q.v.) is the largest, including within its basin nearly all the region in the central lowland section, and a large area of the Rocky and Appalachian Mountains. The chief tributary is the Missouri (q.v.) which has a drainage area of about 530,000 square miles. Next in drainage area is the Ohio River (q.v.), the basin of which is over 200,000 square miles; the Arkansas, 185,671 square miles; the Red River, nearly 90,000 square miles. The total area drained by the Mississippi, its tributaries, and other streams which enter the Gulf, is 1,726,000 square miles. The Rio Grande, which also enters the Gulf of Mexico, has one large tributary, the Pecos. Further streams which flow into the Gulf of Mexico are the small Colorado, the Brazos and others in Texas, and several rivers in Mississipni, Alabama and Georgia. The Mississippi and its tributaries are navigable for thousands of miles. To the great central waterways is due the early development of the interior of the United States, first as a section with trading posts and forts at convenient places on the navigable streams, and later as a farming and manufacturing region. West of the divide in the Rocky Mountains the drainage is to the Pacific Ocean. Nearly all the rivers, except those in the Great Basin, flow directly, or through a main stream to the open sea. The Colorado River enters the Pacific Ocean through the Gulf of California. The largest river of the Pacific Basin is the Columbia (q.v.). Some of the other important rivers are the Sacramento, San Joaquin, Klamath and a number of short streams. The rivers in California and some of the other valleys follow the course of the valleys, but the Columbia, Colorado and branches of the Columbia break through the mountains in several places and thus form high waterfalls and series of cascades. The Columbia has several large tributaries, chief of which is the Snake River. The rivers of the Atlantic Basin east of the Appalachians have mostly rapid currents, and have had great influence in the development of the manufacturing industries of the country. Many of the streams which flow into the Atlantic, or into wide bays which are arms of the ocean, are tidal streams for some distance

inland. (See DELAWARE; HUDSON, etc.). The principal rivers of this basin are the Kennebec, Merrimac, Penobscot and Manchester in the northeast; the Connecticut, which flows into Long Island Sound; the Housatonic, the Hudson, a magnificent stream, alike remarkable for its scenery and its navigable importance, which flows south for 300 miles and contributes to form the harbor of New York; the Delaware, which after a course of 300 miles enters the Delaware Bay and is navigable for large steamers to Philadelphia, a distance of 40 miles; the Potomac, which flows into Chesapeake Bay, and is navigable for the largest vessels to Washington, a distance, including the bay, of 200 miles; and the Savannah, which enters Savannah Bay and is navigable for large vessels for 17 miles, to the city of Savannah, where it forms an important harbor. Besides the rivers, one of the most remarkable features of the United States, as also of Canada, is the chain of large fresh water lakes: Superior, Michigan, Huron, Erie and Ontario. The lakes drain an area of about 90,000 square miles, and send their waters into the Saint Lawrence, after precipitating the greater part of them in an accumulated mass over the renowned Falls of Niagara (q.v.), which are between Erie and Ontario. The rivers of the United States which flow into the Great Lakes (q.v.) are of no great length. The chief streams are the rivers of northern New York and Vermont, some of which enter the Saint Lawrence River through Lake Champlain; the Genesee River in the west central part of New York, and a number of small streams which enter Lakes Erie, Huron, Michigan and Superior. (See SAINT LAWRENCE RIVER). The Red River of the North enters the Atlantic Ocean through Lake Winnipeg and the Hudson Bay. In the interior of the United States are many groups of small lakes which have been mentioned in articles on the different States. The inland seas or salt-water lakes within the Great Basin are of special interest as being the remnants of large inland seas. The fresh-water lakes in the Appalachian section, and even the Great Lakes, were once much larger than at present. The chief characteristics of the whole drainage system of the United States are that by far the greatest portion of the waters are carried south or in a southern direction, and reach the Atlantic Ocean through the Gulf of Mexico. The Great Lakes with their large outlet, the Saint Lawrence River, receive but a small portion of the drainage; their chief supply comes from the melting snows of the Rocky Mountains. The rivers which enter the Pacific are small streams, except the Columbia and Colorado. The Red River of the North is the largest stream which flows north.

Climate.— The main land-mass of the United States is in the temperate zone, and the climatic conditions of the whole country are about what is general in such zones modified chiefly by the great mountains and the winds. With every variation of surface it possesses every variety of climate, from that of the tropics to that of the Arctic regions. It is at the same time one of the hottest and one of the coldest countries; one of the wettest and one of the driest. The prevailing winds are from the west and are an important factor in the climatic conditions. The circulations of air from west to east does not take place in steadily blowing winds, as is the case with the trades, but in cyclonic or whirling storms that have a general easterly movement alternating with anticyclonic movements of a similar character. In these storms winds blow from all directions, the general course being nearly toward the centre of the storm. There is another class of storms which occur not infrequently, although they do not form part of the regular air circulation. This is what is commonly known as the West Indian hurricane, very violent and of a much more intense type than the ordinary cyclone of temperate latitudes. Originating in the tropics, their course is generally over the West Indies, entering the United States on the Gulf Coast and working off to sea in a northeasterly direction. Many of these have been extremely disastrous. The average annual temperature of the extreme southern part is 75° F. and of the extreme north 45°. The average temperature for January in the extreme north (exclusive of Alaska) is about 20°; for July about 60°. The mercury falls as low as 40° below zero in the northern part of Minnesota, and is sometimes as high as 120° in the hot, dry sections of Arizona and Texas. The west winds, which are prevalent in January, and which sweep over large interior areas lower the temperature, frequently to the minimum. The difference in temperature of places in the same latitude on the Atlantic and Pacific Coast is quite marked. That of the Pacific is much warmer than that of the Atlantic. The rainfall is generally the greatest in Washington, Oregon and Florida, but the humidity is great in the southern portion of Louisiana and other places along the Gulf Coast. The region around the Great Lakes has not an excessive humidity; but it is subject to extreme and rapid changes in temperature. This region is also subject to extreme changes in the winds. The Mississippi Valley receives its rainfall almost entirely from the Gulf while the Atlantic States are supplied from the Atlantic Ocean. It is estimated that the Gulf supplies fully 55 per cent of the total rainfall in continental United States, the Pacific Ocean 30 per cent and the Atlantic 15 per cent. See AMERICA — CLIMATIC CONDITIONS; RAINFALL.

Flora.— The wide range of soil, topography and climate give the United States a rich and varied flora. Tropic species are found in Florida, California, Texas, New Mexico and Arizona, along the southern frontier, while along the Canadian border boreal species abound. In the greater part of the country, as might easily be inferred from its geographical situation, the species are those of the north temperate zone and to a large extent are peculiar to North America. (See AMERICA — FLORA). The whole number of indigenous species, exclusive of the lower cryptograms, probably amounts to 5,000, and of these many have a very wide range. The number of woody species is about 850, and about half of these are of a size to be called trees. Of the larger and more important, excluding all the smaller ones, and also the tropical species of the southern border States, there are about 150 species which are of economic importance. About 50 of these belong to the Coniferæ. This coniferous growth extends in enormous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Mission City
Revelstoke
Calgary
Saskatoon
Saskatchewan R.
Lake Winnipegosis
Lake Manitoba
Arrow Lake
Kootenai Lake
Medicine Hat
Pasqua
Qu'Appelle R.
Portage la Prairie
Brandon
Estevan
Morris
TURTLE MTS.
Pacific Jc.
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Willmore
Kenmare
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Devils Lake
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Grand Forks
Fort Benton
Great Falls
Missouri River
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Carrington
Jamestown
Valley City
Fargo
Harlowton
Billings
Laurel
Yellowstone R.
Miles City
Big Horn
Powder R.
Mobridge
Aberdeen
Watertown
Ortonville
Indian Valley
Weiser
Idaho City
Boise
Nampa
Ketchum
Payne
Mountain Home
Shoshone
Silver City
Shoshone Falls
McCammon
Pocatello
Idaho Falls
Yellowstone National Park
Sheridan
Gillette
Dead
BLACK HILLS
Newcastle
Belle Fourche
Whitewood
Rapid City
PIERRE
Redfield
Huron
Hot Springs
Chamberlain
Mitchell
Sioux Falls
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Reno
Carson Sink
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Owens Lake
Death Valley
Mojave
Barstow
Needles
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Silver City
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Las Cruces
Carlsbad
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Estacado or Staked Plain
Childress
Amarillo
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Brazos R.
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San Marcos
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Shumla
San Antonio
Spofford
Eagle Pass
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Nuevo Laredo
Rio Grande
Jimenez
Chihuahua
Conchos R.
Sierra Madre
Guaymas
Yaqui R.
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Sonora R.
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SOUTH DAKOTA
NORTH DAKOTA
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SIERRA NEVADA
BITTER ROOT MTS.
WASATCH MTS.
WHITE MOUNTAINS
SOUTH MOUNTAIN
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Dolores R.
San Juan R.
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Verde R.
Bill Williams R.
Virgin R.
Sevier R.
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Utah Lake
Great Salt Lake
Lake Tahoe
Mono Lake
Owens Lake
Death Valley
Tulare Lake
Klamath Lake
Goose Lake
Malheur Lake
Harney Lake
Warner Lakes
Summer Lake
Abert Lake
Crater Lake
Diamond Lake
Eagle L.
Horse L.
Pend Oreille L.
Flathead Lake
Whitefish L.
Kootenai Falls
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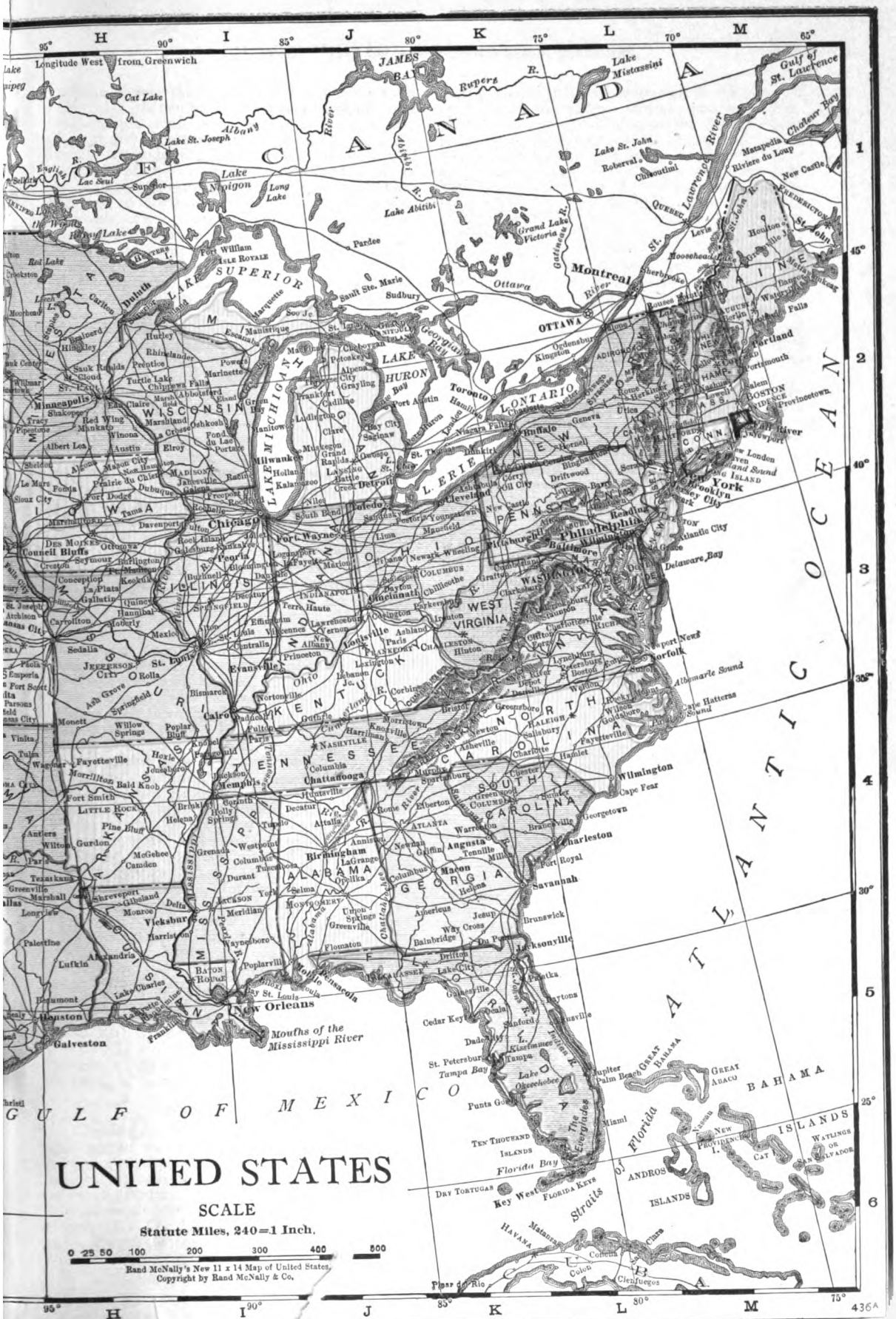
Longitude West from Greenwich
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CANADA
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Chicoutimi
Metapedia
Riviere du Loup
New Castle
Fredericton
St. John
St. Lawrence R.
Quebec
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Grand Lake Victoria
Gatineau R.
Montreal
Ottawa
Ottawa River
Lake Superior
Port William
Isle Royale
Sault Ste. Marie
Sudbury
Parree
Lake Nipigon
Long Lake
Lake St. Joseph
Albany River
Cat Lake
Lac Seul
Superior
Duluth
Marquette
Manistique
Escanaba
Lake Michigan
Lake Huron
Georgian Bay
Toronto
Lake Ontario
Hamilton
Niagara Falls
Buffalo
Rochester
Syracuse
Utica
Albany
Boston
Portland
Portsmouth
Lowell
Worcester
Springfield
Hartford
New Haven
Long Island Sound
New York
Brooklyn
Jersey City
Newark
Trenton
Philadelphia
Reading
Pittsburgh
Baltimore
Wilmington
Atlantic City
Delaware Bay
Lake Erie
Cleveland
Detroit
Toledo
Fort Wayne
Chicago
Milwaukee
Green Bay
Minneapolis
St. Paul
Duluth
Sault Ste. Marie
Sudbury
Ottawa
Montreal
Quebec
Boston
Portland
New York
Philadelphia
Baltimore
Washington
Norfolk
Newport News
Albemarle Sound
Cape Hatteras
Wilmington
Cape Fear
Charleston
Savannah
Jacksonville
Tampa
Tampa Bay
Key West
Florida Keys
Florida Bay
Ten Thousand Islands
Everglades
Miami
Palm Beach
Jupiter
Great Bahama
Great Abaco
Bahama Islands
Andros Islands
New Providence I.
Watlings or San Salvador
Cat I.
Havana
Matanzas
Cardenas
Colon
Cienfuegos
Pinar del Rio
Strait of Florida
Atlantic Ocean
Gulf of Mexico
Mississippi River
New Orleans
Mouths of the Mississippi River
Galveston
Houston
Beaumont
Lake Charles
Alexandria
Shreveport
Vicksburg
Meridian
Jackson
Montgomery
Birmingham
Atlanta
Chattanooga
Nashville
Memphis
Louisville
Cincinnati
Columbus
Indianapolis
Springfield
Peoria
Chicago
Milwaukee
Madison
Green Bay
Minneapolis
St. Paul
Duluth
Sault Ste. Marie
Sudbury
Ottawa
Montreal
Quebec
Boston
Portland
New York
Philadelphia
Baltimore
Washington
Norfolk
Wilmington
Charleston
Savannah
Jacksonville
Tampa
Key West
Havana
Gulf of Mexico
Mississippi River
New Orleans

volume down the cool, wet Pacific slope to central California; the giant redwoods and sugar-pines, etc., and the huge sequoia, the largest and oldest plants on the earth, being famous everywhere. The conifers abound also through Michigan, Wisconsin and Minnesota to southern Missouri and northwestern Arkansas and to northeastern Texas and Oklahoma. The hickories, sequoias, magnolias, sassafras, etc., so abundant in America are only found in fossil form in the Old World. Many valuable varieties of grasses have originated from native species. Near the Atlantic Coast and along the southern borders European explorers found maize, squashes, tobacco and other useful plants in cultivation among the aborigines. Central United States has prominent deciduous (hardwood) trees, such as the oak of many varieties, the beech, maple, elm, chestnut, black walnut, hickory, ironwood, pepperage, red mulberry, etc. In the Southern States the yellow pine holds foremost place. The characteristic forms in the South are the magnolia, palmetto, tulip-tree, plant-tree, pecan, etc., with the cypress everywhere in the swampy regions. The plains are treeless, except a narrow belt along the water courses, and are covered with grasses, grading in the more arid regions into artemesias and cacti. The Cordilleran woods are chiefly conifers on the mountains; on the plains and in the valleys are the yuccas, cactus, etc., as stated above, and whose dense thorny growth is termed chaparral. In the Appalachian Mountains and the upper Mississippi Valley, broad-leaved, deciduous trees, oaks, chestnuts, walnuts, poplars and cherry predominate; and in the Great Lake region pines, firs, spruces and larches are most abundant. The timber trees are considered elsewhere under their own heads, oak, ash, etc. (qq.v.), also under LUMBER INDUSTRY OF THE UNITED STATES; FORESTRY. Other economic products of the native flora fall naturally into the classes of fruits, nuts and forage grasses. The native nuts include pecans, walnuts, chestnuts and pine nuts. The fruits include wild raspberries, blackberries, blueberries, elderberries, cranberries and serviceberry. The principal varieties of grasses are Kentucky blue grass, grama grass, bunch grass, buffalo grass, the clovers, lupine and white sage. To these must be added the hundreds of plants of all sorts from fungi to trees which have been introduced since the white settlement. Some are of economic value while others are among our most noxious and troublesome weeds. The white daisy is one of the latter as also the buttercup, dandelion, chickory and thistle. Chinese, Japanese and Mexican species have been introduced with success in California. The eucalyptus, several species of palms, English walnut, olive, prune, almond, etc., are now grown successfully.

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Editorial Staff of The Americana.

Geology.— There is great diversity in the geology of the country, a diversity that extends to the constituent rock formations, their distribution, structural arrangements and contained mineral deposits. Every important rock system is represented in its stratigraphy by one or more members. The basal formations belong to the early Pre-Cambrian and consist of ancient igneous rocks, like granite and various lavas, with highly metamorphosed sediments in the form of crystalline limestones, schists and quartzites. Such occur along the axis of the Appalachians from New England into Alabama, and in the Black Hills, Ozarks and Rocky Mountains; they are also developed on a larger scale in the Adirondacks and in the Lake Superior district, where they constitute outlying areas of the so-called "Laurentian shield" of Canada which has a surface of 2,000,000 square miles. These rocks are particularly rich in iron ores, but yield also various other valuable minerals. In the Lake Superior district the Keweenawawan beds of sandstones and intercalated lavas mark the closing stages of Pre-Cambrian time; they attain an estimated thickness of 40,000 feet and are the sources of the great deposits of native copper that occur on Keweenaw Peninsula of Upper Michigan.

A long period of time elapsed in most places after the Pre-Cambrian until the first deposits of the Paleozoic group were formed, the hiatus being marked by a strong unconformity caused by erosion. The ensuing Cambrian strata rest upon the eroded and more or less upturned Pre-Cambrian rocks and are generally to be distinguished by their less altered condition and wealth of fossils. The Cambrian, Ordovician and Silurian strata, the older members of the Paleozoic group, spread over extensive areas in the eastern United States, lying along the borders of the crystallines in successive overlapping series. Altogether they have here a thickness probably of seven or eight miles, mainly sandstones, shales and limestones. In the west they occur in smaller belts and isolated patches. The valuable minerals are oil and gas in the Ordovician and Silurian, salt in the Silurian and iron ore represented by the beds of Clinton hematite which extend from central New York in interrupted outcrops all the way to northern Alabama.

The succeeding members of the Paleozoic included in the Devonian and Carboniferous systems are largely sediments that accumulated in great thickness in the Appalachian belt and west as far as the Mississippi Valley, also to a lesser extent in the Rocky Mountain and Great Basin regions. Oil, gas and coal abound in these strata, the Carboniferous being a great coal-making period the world over. With the close of Carboniferous time a great change took place in the eastern part of the country, by which the sediments along the Appalachian region were uplifted from the sea and folded into mountains, which have ever since remained as a highland.

The Mesozoic strata are usually grouped into the Triassic, Jurassic and Cretaceous systems. A belt of Triassic rocks parallels the Atlantic Coast from North Carolina to New England. Sandstones, shales and trap are the chief rocks, the Palisades of the Hudson exemplifying one of the exposures of Triassic trap, a basic volcanic rock. Extensive exposures of Triassic strata are met with in the western interior, where they seem to have been accumulated in shallow lakes and as wind deposits. Jurassic rocks are limited in development mostly to the Pacific Coast. The Cretaceous was a period of extensive sedimentation, and its rocks spread in a wide belt from the Gulf of Mexico northward across the central United States and Canada to the Arctic Ocean. A thickness of four or five miles is attained by the sediments in the

Rocky Mountain region. Valuable coal measures accompany the beds, second in importance only to those of the Carboniferous. Oil and gas also are found in the Cretaceous strata. Two mountain systems had their beginnings in Mesozoic time: the Sierra Nevadas were reraised in late Jurassic and the Rockies at the end of the Cretaceous period.

The Tertiary formations, which comprehend the greater part of the Cenozoic group, are spread in discontinuous patches over the western United States and in a long belt that stretches along the southern Atlantic Coast and the Gulf region, reaching up the Mississippi Valley to the Ohio River. Some important coal beds of lignitic character were deposited in the interior during the early Tertiary. The strata otherwise include sandstones, shales, soft limestones and unconsolidated detrital materials. The later Quaternary deposits are largely represented by glacial accumulations from the ice-sheets that extended from the highlands of Canada into the northern part of the county; on melting the ice left behind a mantle of sands, gravels and clays, here and there heaped up into hillocks (kames, drumlins, eskers, etc.), that lie over all of the other formations. To the south of the limits of ice advance, which did not reach below the Ohio River, stream and estuary deposits were formed at this time and on the uplands the finely divided, probably wind-blown material called "loess." At the outset of the ice invasion the land surface was considerably higher than at present and the northeastern coast line no doubt extended 100 miles or more further out into the Atlantic, to the limits of the continental shelf. This elevation and increase of land area thus indicated were influential in producing the glacial climate, although not the only factors concerned with it. At the close of the Glacial epoch a subsidence took place, causing the sea to advance upon the land and producing fiords and drowned valleys along the coast, as now in evidence.

Mineral Wealth.— The United States is well provided with mineral resources, particularly of the more essential materials like coal, petroleum, salt and the ores of iron, copper, lead and zinc. Clays of various kinds and building stones are widespread, while the precious metals and many of the rarer minerals occur in important quantities. Practically all of the mineral requirements for industrial needs and home consumption are supplied from domestic sources; the principal exceptions that may be noted are tin, platinum, manganese ores, nitrates and potash salts, of which the native production is usually supplemented by imports from other countries. The growth of mining has been one of the important elements in the remarkable industrial development that has taken place in the last four or five decades and given the country its prominent position in the world's industry and trade.

Coal.— The coal fields of the continental United States underlie an estimated area of 310,296 square miles, not including certain possible fields about which little is now known or fields in which the coal is too deep to be available. The coal content is put at 3,076,204 millions of tons, and is now being consumed at the rate of 600 million tons a year. The principal fields are the Appalachian, which produces both bituminous and anthracite, the interior bituminous field, the Rocky Mountain and Great Plains fields of bituminous and lignite and the Pacific Coast fields, inclusive of Alaska, in which the coal is chiefly bituminous. Thirty States are represented in the mining industry, the chief producers being Pennsylvania, West Virginia, Ohio, Illinois, Kentucky, Indiana, Alabama, Colorado, Virginia, Iowa, Kansas and Wyoming.

Petroleum.— The exploitation of the oil resources began about 1860 in western Pennsylvania. In the following years the field was enlarged by drilling so as to cover parts of New York, Ohio and West Virginia, constituting with Kentucky and Tennessee the Appalachian field, which is still an active producer. The oil from this field contains a high percentage of the lighter distillates and has a paraffine base. Next in aggregate yield is California which has been a producer for over 40 years, mainly of heavy asphaltic oils. Its product comes mainly from the southern part of the State and has grown rapidly in the last 15 years. Even more recent and phenomenal has been the growth of oil production in Texas, Oklahoma and Kansas, or the Mid-Continent field, which now accounts for fully one-half of the entire yield of the country. Other important States in the industry are Louisiana, Illinois, Indiana and Wyoming. The total output in 1918 was 355,927,716 barrels, valued at $703,943,961.

Iron.— The production of iron ore is carried on in 21 States, while there are unworked deposits in several others. The principal ore is hematite, which is mined most extensively in the Lake Superior district of Minnesota, Wisconsin and Michigan, with Duluth as the chief shipping centre. Alabama has a large mining industry, based on deposits of hematite that occur in the vicinity of Birmingham. New York State contributes mainly magnetite ores that are found in the Adirondacks and the Highlands of the Hudson. The possession of important iron ore supplies and of coking coal gives a foundation for large iron and steel manufactures, in which the United States ranks pre-eminent. The output of pig-iron in 1918 was 38,230,440 long tons, valued at $1,180,759,565.

Gold and Silver.— The precious metals are produced mainly in the West. The opening of the California placer mines in 1849 marked the beginning of large-scale operations which soon gave the country leadership in the industry, only reliquished in late years. All of the Rocky Mountain States yield more or less gold and silver, but California, Colorado, Montana, Nevada, Idaho and Utah are the leading producers. South Dakota should be added to the list as having important gold resources. The gold placers which at first supplied most of the metal, are of secondary importance at present; quartz veins and lodes have largely superseded them for mining purposes. The output of gold in 1918 was 3,313,313 fine ounces and of silver 67,879,206 fine ounces.

Copper.— Copper ores are found in Michigan and most of the western States with Arizona, Montana, Utah, Nevada and New Mexico as especially prominent producers. Michigan came into prominence about 1840; its ores carry native copper and are found on Keweenaw Peninsula that projects into Lake Superior. The western deposits began to attract attention in the last quarter of the 19th century and have lately come under intensive development that has caused the production to double in a few years.

The total output in 1918 was 1,908,533,595 pounds.

Lead and Zinc.— The principal lead deposits are in Missouri, Idaho, Utah and Colorado. The output is now above 500,000 tons a year. Zinc ores are extensively mined in Missouri, New Jersey, Montana, Colorado and Idaho and the product of metallic zinc is about the same as that of lead.

Salt.— Rock salt is mined in New York, Michigan, Kansas and Louisiana, while natural brines are utilized for salt manufacture in many States. The total yield of salt in 1918 was 7,238,744 short tons, valued at $26,940,361. Much of the product is utilized for chemical purposes, particularly for making other sodium salts like the carbonate and bicarbonate, salt cake (sodium sulphate) and caustic soda.

Quarry Materials.— Stone for building and engineering works is extensively quarried in nearly all States. New England supplies the larger part of the granite for building and monumental purposes from quarries situated in Vermont, Maine, Massachusetts, New Hampshire and Connecticut. New York and Wisconsin have granites suitable for almost all uses. Marbles are quarried in many of the Appalachian States, notably Vermont, Tennessee and Georgia, and sandstone and limestone over much of the country. Limestone serves a variety of uses besides for constructional work, it being employed as flux in metallurgical operations, as a chemical reagent and for Portland cement manufacture, an industry that has made rapid progress in the last two decades.

Clay Products.— The manufacture of clay wares and building materials constitutes one of the more important and widely represented branches of the mineral industry, the total value of the output in 1917 amounting to $248,023,364. Practically every kind of pottery is now made, although the demand for high-grade porcelains and art wares is scarcely met by the domestic products and considerable quantities are imported. The ceramic industry is chiefly centred in New Jersey and Ohio, but the white clays used in the best wares come from the South. Clay building materials are made in most of the States, with New Jersey, New York, Pennsylvania, Ohio and Illinois as the larger producers.

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2. GENERAL OUTLINE HISTORY (1776–1920). At the close of the French war England had no settled policy of colonial administration, nor could there be said to be a definite understanding as to the constitutional relationship of the colonies to the mother-country. She entered upon plans which brought before long the loss of her dominions in America. Her ministers, anxious for funds, determined that America should make some contribution to the expense of colonial protection, and moreover that the navigation laws and acts of trade should be enforced. These acts had been systematically broken for decades, and stringent efforts to enforce them could mean nothing less than a violent interference with New England traffic. Moreover the colonies had without intermission taxed themselves and passed laws in their own legislatures. When the Stamp Act (q.v.) of 1765 was passed, a storm of protest arose from the colonists, who declared that taxation without representation is tyranny. The Parliamentary orators, on the other hand, asserted that Parliament had a right to tax the colonies, that taxation was only a part of the sovereign power and that all legislative authority resided in the English government. The repeal of the Stamp Act was coupled with a declaration of the supreme authority of Parliament, and to the principle of this declaration the American leaders were never willing to accede. The imposition of import duties in 1767 met also with strenuous opposition in America, and when three years later all duties were abandoned except the tax on tea, the concession was not gratefully received by the colonists. Meanwhile troops had been sent to Boston, and an encounter between a detachment of the soldiers and a few citizens ended in bloodshed (1770). The Boston Tea Party (q.v.) of the year 1773 was evidence that the device of a low duty would not tempt the New Englanders to give up their principles. The ministry now entered more seriously on efforts at coercion and passed a series of acts, the most grievous of which was the Boston Port Bill, which it was hoped would have the effect of bringing the colonists to a due respect for imperial power; but, instead of improving, conditions grew worse. In September 1774, the first Continental Congress met at Philadelphia and issued a declaration of rights and other papers. The advanced American leaders, admitting that all were subjects of a common king, were now unwilling to acknowledge the authority of Parliament in any respect; although others, denying the right to tax, were still ready to argue that the British legislature could manage commerce and external affairs. The petition of the colonists was of no avail, and the Revolution passed from the stage of controversy to that of war.

The War of the Revolution falls into three periods. Between 19 April 1775, the date of Concord and Lexington, and 4 July 1776, the revolting colonists were gradually brought by events and arguments to the notion of independence. The efforts of the British were as yet directed mainly to the repression of the uprising in Massachusetts. On 17 June 1775, Bunker Hill was fought. During the preceding month the second Continental Congress had convened at Philadelphia and bestowed the command of the American forces upon Washington. In March 1776, Howe evacuated Boston. On 7 June Richard Henry Lee of Virginia moved a resolution in Congress declaring the independence of the colonies. The adoption of this resolution, 2 July, and the Declaration of 4 July, gave the Revolution a new character. It was now a war for independence and not for rights as colonists or Englishmen. Indeed the discussion had already advanced to a stage in which the Americans, though ostensibly demanding rights known to the law, were in reality asserting fundamental principles and seeking to obtain their recognition in the law of the land; they were working for the legal formulation of a democratic doctrine. Of this doctrine the Declaration is an embodiment, as were some of the State constitutions which the people were now constructing. The most important proposition was that people exist before government and are possessed of natural rights which are inalienable, and which governments, the work of their hands, cannot rightfully take away.

The second period of the Revolution, beginning with the Declaration, ends with the entrance of France into the war. During this period it was the endeavor of the British to separate Massachusetts and Virginia by gaining control of the Champlain-Hudson Valley. The battle of Long Island, August 1776, left New York in the hands of the British, and a year later Washington, defeated at Brandywine, was forced to yield Philadelphia to Howe. But in the meantime, Burgoyne, who had been sent from Canada to effect the main object of the British campaign, had been getting into difficulty, and on 17 Oct. 1777, he was forced to surrender to Gates at Saratoga. This victory probably determined the result of the war. France, who had hitherto contented herself with secretly aiding the Americans, in February 1778 entered into a treaty of alliance with them, hoping to secure thereby the enfeeblement of her ancient enemy, England.

The United States could hardly have achieved their independence without the French alliance. France was able to furnish the sea power, without which it is highly improbable that Yorktown could have been won. On the other hand, there is evidence that England entered into the contest with new zeal, now that she was confronted by her old enemy, France; and after the French alliance the Americans were more than once grievously near defeat.

The third period of the war ends with the signature of the treaty of peace at Paris, 3 Sept. 1783. Aside from Arnold's treason, interest in this period is confined to the South. Here the Loyalists were strong, and the British hoped to save at least Georgia and the Carolinas. In 1778 Savannah was captured and Georgia was overrun by the British. In 1780 Charleston fell and Gates was utterly defeated at Camden by Cornwallis. The tide began to turn with the opening of 1781, when Greene took command in the South. Winning no victories, he nevertheless sold victory so dearly that by September Cornwallis was retiring northward, leaving the entire South, except Savannah and Charleston, in the hands of the patriots. Cornwallis entered Yorktown, Va., and was there besieged by the French fleet under De Grasse and the American and French armies under Washington and Rochambeau. He surrendered 19 Oct. 1781.

In the peace negotiations at Paris, which filled the year 1782, the United States was represented by Franklin, who had been in France since 1777, Jay and John Adams. They succeeded in making a favorable treaty. The western boundary of the States was set at the Mississippi, and their southern at the 31st parallel as far as the Appalachicola River, from which point it proceeded along the present north boundary of Florida to the Atlantic. The area of the territory lying within these boundaries was 827,844 square miles. Before the war was over the States had adopted Articles of Confederation and Perpetual Union (1 March 1781). These articles apparently purported to have sovereignty in the individual States; and after the war was over, the States showed lack of appreciation of continental obligations and privileges. The Congress of the Confederation, in which body all the power granted by the Articles was centred, proved ineffective, for in cases of crucial need it could do little more than implore the States for funds or solicit obedience to the orders which it had issued. There was no power in the central authority to collect taxes or regular commerce. Things went from bad to worse—the States eyeing each other in jealous scrutiny; the debt of the Confederation growing larger, while the States, themselves distressed, refused to furnish the needed money; England refusing with some cause to surrender the western ports within our territory; Spain refusing to acknowledge our right to navigate the lower Mississippi. Washington wrote, "Something must be done or the fabric will fall, for it certainly is tottering." One great bond of union, one fact of national significance needs, however, to be mentioned. By 1786 the States that claimed land east of the Mississippi, north of the Ohio and west of Pennsylvania had surrendered their claims, Connecticut still retaining a small portion which was long known as the Western Reserve. For the organization of this domain, Congress passed the Ordinance of 1787, one of the great State papers of American history; it provided for temporary governments, for the final admission of the Territories as States, and for the permanent exclusion of slavery.

In May 1787, a convention of delegates met at Philadelphia, charged with the duty of rendering "the Federal Constitution adequate to the exigencies of the Union." The work lasted four months. Its product was the Constitution of the United States. As to whether the convention should disregard instructions and proceed to draw up a new constitution instead of altering the Confederation, there was much discussion, tinged frequently with acrimony. The "large-state party" insisted on a government with authority and on proportional representation. The "small-state party," some of whom were not adverse to a national government, yet feared for their States, and, in jealousy of their stronger neighbors, advocated equal representation of the States. The outcome was compromise: the legislature of each State was to have the right to elect two members of one branch of the national legislature, while the principal of proportional representation was to obtain as a basis for the other house. The Constitution, abandoning the old principle of the Confederation, provided for a government immediately over individuals; it provided for a system whereby every citizen would be subject to two governments. The powers delegated to the new government were enumerated powers, and the field of political activity was thus divided between the central government on the one hand and the State on the other. The Constitution provided for executive, judicial and legislative departments and applied the principle of separation of the powers. The instrument thus prepared was passed on by conventions in the States. The struggle over the adoption was very sharp; but by the end of 1788 the Constitution had been ratified by all the States save Rhode Island and North Carolina. The government called for by the new Constitution was put into operation before these two States ratified. To reassure those who were fearful that the national authority would be destructive of individual liberty, the first 12 amendments to the Constitution were drawn up by the first Congress, and 10 of them were ratified by the States.

Washington was unanimously chosen the first

RELIEF MAP OF THE UNITED STATES

Modeled by the U. S. Survey

President of the United States and took the oath of office on 30 April 1789. Congress had already assembled and begun important tasks of legislation. There was a crying need for revenue, and a tariff bill was soon passed. The government was quickly put into working order; necessary executive departments were established; a Supreme Court and inferior tribunals were founded. Washington made Thomas Jefferson Secretary of State, Alexander Hamilton Secretary of the Treasury and Henry Knox Secretary of War. The first two represented different tendencies in American life, and about them are crystallized the two leading parties of the country; about Hamilton the Federalists, who were strong supporters of his policy, and about Jefferson the Republicans, who believed that Hamilton was intent upon establishing monarchical institutions. Not for some time, however, were these parties really organized, and the word organization seems hardly applicable to the political parties of 120 years ago when compared with those of the present time. Jefferson had faith in the people and was responsive to the impulse of democratic America; Hamilton had rare talent for organization and administration, and represented the conservative forces of the time. The Federalists advocated a broad and liberal interpretation of the Constitution; the Republicans favored a strict interpretation, fearing that the Federalists would make use of their power to injure State rights or individual liberty. In the determination of the political affiliations, Hamilton's financial policy had much to do. He advocated the funding of the public debt and the assumption of the State debts with the understanding that the creditors should be paid in full. He also proposed the establishment of a national bank and the levying of an excise tax, and raising adequate revenue by a tariff so arranged as to offer also support to American manufactures. All of these measures were adopted, and he thus brought to his support the holders of the public debt and, as a rule, the commercial and more substantial classes in the community.

The difficulties of Washington's first administration centred chiefly in domestic affairs. Just before the beginning of his second administration war broke out between England and France, and for the next 20 years American politics and interests were much affected by European conditions. The Federalists, on the whole, sympathized with England, whereas the Republicans, having different industrial interests, were more inclined to sympathize with France. Difficulties of various kinds reached their climax in 1794, when the stability of the government was in danger. An insurrection against the whisky tax had broken out in western Pennsylvania; the Indians had for some years been waging war in the Northwest, and two armies sent to suppress them had been defeated; the English, indignant at the way in which Genet, the French Minister to America, had been allowed to use our ports, were giving evidences of hostility and there was imminent danger of war. American commerce was ill-used by the British, who were not willing to see the Americans profiting by the contest between England and France. These serious difficulties were finally disposed of by prompt and discreet action on the part of Washington's government. An army sent to western Pennsylvania suppressed the insurrection; General Wayne overwhelmed the Indians at the battle of Fallen Timbers; and John Jay, despatched as a special envoy to Great Britain, succeeded in making a treaty which, for a time, reconciled the two countries and did something to allay the ill-feeling that had been near bringing on open war. When Washington's second administration ended the government was well founded; there were strong evidences of national patriotism and, despite the high degree of partisan bitterness, there was no reasonable ground for fear that the country would relapse into the state of confusion such as existed eight years before.

John Adams was the second President of the United States. He inherited, as his chief trouble, the French dissatisfaction with the Jay treaty and with the way in which the United States had received France's claims to special consideration. The French, too, were not considerate in their treatment of American commerce. Adams, hoping to arrange affairs amicably, sent a commission to Paris with authority to treat. This commission was treated with contumely by the Frenchmen and was given to understand by messengers sent from Talleyrand that America must furnish money and offer bribes if she would have her interests considered. When this story was told in the United States, the people were righteously indignant; an army was organized, Washington was put at the head of the troops, hostile engagements actually occurred between ships of the two countries at sea and it was fully expected that war would ensue. Adams, however, listening to intimations that came in a roundabout way from Talleyrand, appointed a new commission and succeeded in coming to terms with France. In the meantime the Federalists, influenced by the prevailing excitement, had passed two measures of dangerous tendency—the Sedition Act and the Alien Act, against which the Republicans, under the lead of Madison and Jefferson, strongly protested. Virginia drew up the famous Virginia resolutions of 1798 and 1800, which were the handiwork of Madison, while Kentucky presented similar resolutions, portions of which were prepared by Jefferson. These documents declared against the constitutionality of the Alien and Sedition Laws; the Virginia resolution declared that in case of a plain violation of the Constitution by the central government, the State was «in duty bound to interpose»; in the Kentucky resolutions of 1799 it was announced that «nullification» (q.v.) was the rightful remedy. To explain what was meant by these resolutions would require much more space than the present article allows, and we must content ourselves with saying that there was evident peril in resolutions which purported to put forth the opinion of a State as over against that of the national government, and, moreover, that the resolutions of Virginia and Kentucky were used in later years to support a more extreme doctrine of State sovereignty, nullification and secession.

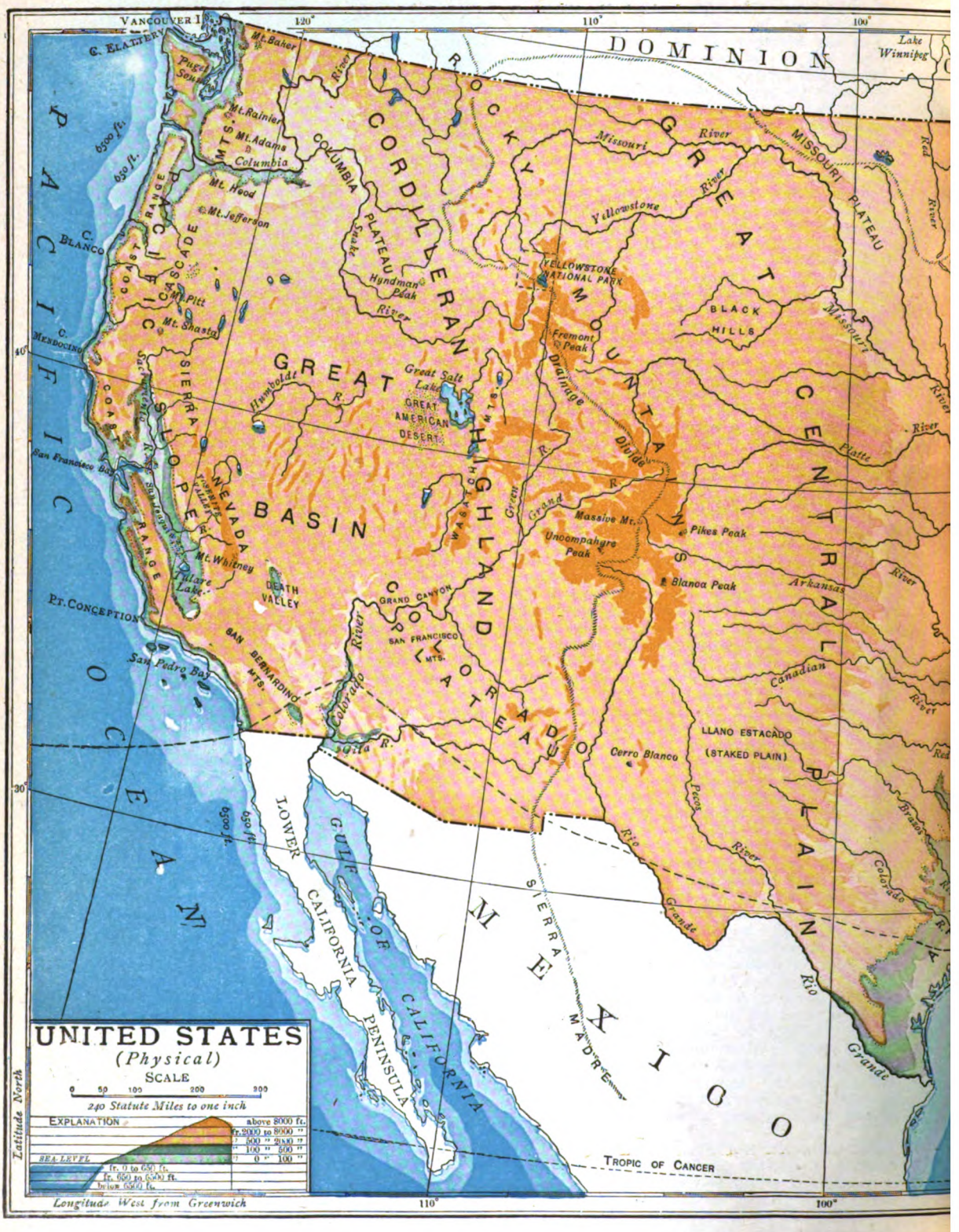
By the original plan for choosing a President the electors did not indicate by their votes whether they were voting for President or Vice-President; they simply voted for two persons. In 1800 Jefferson and Burr, both candidates of

the same party, received an equal number of votes, and it was for some time uncertain which would be chosen President. The House of Representatives, despite the efforts of the Federalists, who voted for Burr, finally elected Jefferson, who became President on 4 March 1801. The passage of the Twelfth Amendment prevented the recurrence of this embarrassment. Jefferson's two administrations were replete with important events, full of perplexity and of difficulties. In 1803 Louisiana was purchased from France for $15,000,000, and thus America became possessed of the great region stretching from the Mississippi westward to the summit of the Rocky Mountains; and Jefferson, the leader of the party which had objected to the broad and liberal interpretation of the Constitution, did more by the acquisition of this territory to assure nationality and the continuance of broad authority in the United States, than did any other President between the foundation of the government and the election of Lincoln. The war, which was still waging in Europe and in which most of the nations of the civilized world were engaged, presented many perplexing problems to the American nation. Our merchantmen were seized on the ocean; our sailors were impressed; our cargoes were confiscated, and in general America was treated as seemed to suit the needs and the whims of England and France. The New Englanders, on the whole, sided with England, or believed, if war must come, that a navy should be built up for American protection. The Southern and Western partisans of Jefferson were more inclined to sympathize with France, while the President himself, averse to war, hoped that the European combatants could be brought to their senses by some system of persuasion or peaceful coercion. The embargo measure of 1807 had the effect, however, of injuring American commerce and threatening American merchants with ruin, but not of bringing either England or France to a proper appreciation of the neutral rights of America.

When Jefferson retired from the Presidency in 1809, to be succeeded by Madison, our foreign relations were in a serious condition; and, in spite of efforts to avoid war by the enforcement of non-intercourse measures and similar expedients, hostilities finally broke out, war being declared against Great Britain in June 1812. The causes of this war need not be discussed here at length. It is sufficient to say, as we have already intimated, that both England and France had been ruthlessly disregarding the most palpable rights of the United States, and that the time seemed to have come when the new republic, though seeking peace and unprepared for war, needed to fight at least one of the European nations that had been doing us so much injury. The War of 1812 is not one which appeals to the enthusiasm, or unduly arouses the patriotism, of the American reader. The forces of the United States were not well handled, nor was there evidence of noteworthy generalship. The most famous battle was the victory of Jackson over the British at New Orleans, which in fact was fought after the treaty of peace had been signed, although of course the fact was not known on this side of the water. On the seas the American men-of-war brought credit and recognition to the nation and doubtless the prowess shown by American captains and seamen did much to establish the United States in the eyes of the European world as a nation to be respected and to be treated with common courtesy. In fact one of our best-known historians declares that the battle between the *Constitution* and the *Guerrière*, which ended in the total destruction of the British frigate, in the course of a short half-hour raised the American nation into the position of a first-class power. And thus, though the war was not crowded with honors for American arms, and though the Treaty of Ghent did not include a settlement of any of the chief difficulties which had brought the war about, the United States had done something to establish itself; there was no longer danger that American seamen would be impressed or that American commerce would be treated with ruthless disrespect. After the war was over America entered on a long period of internal development, for the most part altogether unfretted by foreign complications. In 1817 James Monroe succeeded Madison in the Presidency.

Monroe's administration (1817–25) was in some ways uneventful, but it was not for that reason the less important in American history. These years are called the "era of good feeling." As a matter of fact, there was much bitter feeling, for there was intense rivalry and personal antagonism in State and national parties. But by 1820 there was practically only one party in existence, for the opposition of the Federalists to the war and the gradual broadening of the old Jeffersonian party, had had the effect of attracting all but a few irreconcilables into the old Jeffersonian party, which was, indeed, in most respects, Jeffersonian no longer. The young and vigorous West, naturally opposed to the narrow old-time Federalism, had strengthened the Republican party and helped to give it broader and saner views of national power and duty. In 1816, forgetting their animosity to Hamilton's measures, the Republicans enacted a protective tariff law and granted a charter to the second Bank of the United States. There was in the country at large, moreover, a strong national spirit, a feeling of national strength and independence, itself in some measure the effect of the war, which for a time smothered sectional jealousy and helped to awaken patriotism. The period is also of interest to lawyers as well as to students of politics, as a time when a number of great decisions were rendered by the Supreme Court, giving, as it were, judicial confirmation to the spirit of nationalism that was otherwise manifest. John Marshall, the chief justice, with an able bench of associates, in the case of McCulloch v. Maryland, decided that a State could not tax a Federal agency, and that the Federal government could establish a corporation; and the court gave expression to the doctrine of implied powers which Hamilton had enunciated 27 years before. Near the same time decisions were rendered in Martin v. Hunter's Lessee, Cohens v. Virginia and the Dartmouth College Case—all of great significance in constitutional history and law.

Of most importance in later days was Monroe's stand on the difficult diplomatic problem of his time, arising out of the independence of the South American states, and of the effort of European rulers, combined in the Holy Alliance, to repress popular uprisings. We acknowledged


UNITED STATES
(Physical)
SCALE
0 50 100 200 300
240 Statute Miles to one inch
EXPLANATION
above 8000 ft.
fr. 2000 to 8000 "
" 500 " 2000 "
" 100 " 500 "
" 0 " 100 "
SEA LEVEL
fr. 0 to 650 ft.
fr. 650 to 6500 ft.
below 6500 ft.
Latitude North
Longitude West from Greenwich
DOMINION
Lake Winnipeg
VANCOUVER I.
C. ELATTERY
Mt. Baker
Puget Sound
Mt. Rainier
Mt. Adams
Columbia
Mt. Hood
Mt. Jefferson
C. BLANCO
C. MENDOCINO
Mt. Pitt
Mt. Shasta
COAST RANGE
CASCADE MTS.
PACIFIC SLOPE
SIERRA NEVADA
COAST RANGE
San Francisco Bay
Mt. Whitney
Tulare Lake
DEATH VALLEY
PT. CONCEPTION
San Pedro Bay
SAN BERNARDINO MTS.
PACIFIC OCEAN
6500 ft.
650 ft.
COLUMBIA PLATEAU
Snake River
Hyndman Peak
CORDILLERAN HIGHLAND
ROCKY MOUNTAINS
GREAT CENTRAL PLAIN
Missouri River
Yellowstone River
MISSOURI PLATEAU
Red River
YELLOWSTONE NATIONAL PARK
BLACK HILLS
Missouri River
Fremont Peak
Drainage Divide
Platte River
Great Salt Lake
GREAT AMERICAN DESERT
Humboldt R.
WASATCH MTS.
Green R.
Grand R.
Massive Mt.
Uncompahgre Peak
Pikes Peak
Blanca Peak
Arkansas River
GRAND CANYON
SAN FRANCISCO MTS.
COLORADO PLATEAU
Colorado River
Gila R.
Canadian River
LLANO ESTACADO (STAKED PLAIN)
Cerro Blanco
Pecos River
Rio Grande
Brazos
Colorado
LOWER CALIFORNIA PENINSULA
GULF OF CALIFORNIA
SIERRA MADRE
MEXICO
TROPIC OF CANCER
120°
110°
100°
40°
30°

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the independence of the South American states; and as long as the European powers confined their policy to the eastern hemisphere, their principles were none of our affair. There came, however, evidences of an intention to overcome the new states on this side of the ocean, and Monroe issued his famous message of 1823, announcing that we had no purpose to interfere with European affairs, but that on the other hand any attempt on the part of the European powers to extend their system to any portion of this hemisphere would be considered "as dangerous to our peace and safety."

In this "era of good feeling," characterized by nationalism as it was in the main, arose a great controversy between the free and slave States, a controversy which, as Jefferson said, "rang out like a fire bell in the night"; it foretold sectional animosity and strife. When the Constitution was adopted, slavery existed in nearly all the States, but was gradually disappearing in the North, and even in such a State as Virginia there was strong opposition on principle to the whole system. By 1820 slavery was practically extinct north of Maryland; but in the meantime, because of the invention of the cotton-gin and the development of textile machinery, slave labor had become profitable at the South and the black population had much increased. Virginia statesmen no longer cried out against the system, which was now firmly fastened not only on the Southern States of the old 13, but also west of the Appalachians in the rich and fertile country from the Ohio to the Gulf. The climate and soil of the Southern States were favorable to the African and to the industries based on slave labor; and the big cotton plantation became the significant feature of Southern life. At the beginning of the government almost no cotton was grown in America or exported from its harbors; in 1824 142,400,000 pounds were sent abroad. And thus the Southern States were grounded on a system of labor at variance with the labor system af the free North, which, in its turn, had been extending over the mountain range and on to the Mississippi, filling the western land with laborers who worked with their own hands for gain. Two different industrial systems faced each other across the waters of the Ohio.

The Territory of Missouri lay in the pathway of the expanding West. Slavery already existed there, but when the people asked admission to the Union, difficulties arose. The South wished to have Missouri admitted as a slave State; the North, not averse to its admission, desired to see it a free State. The South needed to have room for territorial expansion, since its agricultural system was ever demanding virgin soil and fresh acres. The North was unwilling to see a new slave State added to the Union and many — it is difficult to say how large the number — were opposed, on principle, to the extension of slavery. The sections were now equally represented in the Senate, though the North had outstripped the South in population. In the House of Representatives the members from the free States numbered 133, while from the South, in spite of the fact that three-fifths of the slaves were counted as a basis of representation, there were only 90 members. If the South was to maintain itself politically, it needed to retain or strengthen its hold on the Senate. The contest over the admission of Missouri was long and bitter. Before it was concluded, Maine, hitherto a part of Massachusetts, sought admission, and the application at once complicated and lightened the problem. The effort to admit Missouri with a restriction providing for the gradual disappearance of slavery within its limits was not successful; and finally it was admitted as a slave State; the act providing for its admission stipulated that, excepting within the limits of the new State, slavery should not exist north of the parallel of 36° 30′, "in all that territory ceded by France to the United States under the name of Louisiana." This was the famous Missouri Compromise (q.v.). Maine was admitted, and the Senate was still evenly divided between the sections. Even more plainly than before, the Union was composed of two series of States, differing one from the other in industrial practices, in social as well as economic habits that were likely to beget misunderstandings and to develop antagonisms. There was really a division of the national domain between the two systems.

The admission of Missouri as a State, only 18 years after the vast region between the Mississippi and the mountains was purchased from Napoleon, is a proof of the remarkable growth of the United States. When the Constitution was adopted, only a few thousand people had found their way over the Appalachians; by 1810 there were over 1,000,000 inhabitants in the Mississippi Basin. Kentucky, Tennessee and Ohio had been admitted as States. At the outbreak of the War of 1812, Louisiana came into the Union, and after the war was over, in the period of industrial reorganization that ensued, thousands flocked into the Western region, peopling the wilderness, clearing the forest for farms and plantations, building villages, establishing civil government. In 1816 alone 42,000 settlers entered Indiana. In six years Kentucky more than doubled her population and Ohio was not far behind. Almost as if by magic prosperous towns appeared where but a short time before there had been nothing but forest or empty prairie land. Before the Missouri Compromise, Mississippi, Alabama, Indiana and Illinois had joined the Union as States. And yet this rapid peopling of the new country was but an example, extreme, perhaps, but typical nevertheless, of the movement that was characteristically American and resulted in the occupation of the great West, as far as the Pacific, in less than 100 years from the formation of the Federal government.

With this Western movement came certain political acts and tendencies, not all attributable solely to Western influence, and yet intelligible only as we see the growth of the country and the development of national sentiment. Already steps had been taken for the building of a great national highway into the West. This at first the South had not opposed; even in 1816 Calhoun, moved by the national spirit of the time, in advocating the expenditure of money for internal improvements, exclaimed in the House: "Let it not . . . be forgotten — nay, let it forever be kept in mind — that our vastness exposes us at the same time to the worst of calamities, dissension. We are great and rapidly, I was about to say fearfully, growing. . . . Good roads and canals will do much to unite us." Ere long the South opposed the building

of roads at national expense; but the West naturally favored making means of access to the East. Henry Clay was the strong advocate of internal improvements; and from him, too, a Western man with Western interests, came the demand for a protective tariff and the "American system." New England at first objected to the tariff as a check to its commerce, while the South was not averse to the practice. But in 1824 the Northeastern States approved protection and the South opposed. Each section, North, South and West, was coming to an appreciation of what seemed its economic interest. The Cotton States, given up to agriculture and to the raising of a great staple, much of which was exported, naturally objected to a tariff which seemed to be a burden on their industry for the benefit of the manufacturing and commercial North. In 1828 the so-called "tariff of abominations" was passed, a measure which in many ways merited its name. This aroused strong Southern opposition and ushered in a course of argument and protest against the action and assumption of the national government, which, with some variation, continued as occasion demanded till the outbreak of the Civil War.

South Carolina, as early as 1828, began to issue argument and objection to the exercise of what it deemed unwarranted authority by the central government, and by 1832 the theories were formulated on which were to rest nullification and the attempted secession of later years. The principles set forth by South Carolina were brilliantly announced by Hayne in the "great debate" with Webster in the Senate in 1830. Webster's eloquent sentences defending the Constitution as the supreme law of the land made deep impression on the people of the North; the inspiring oration, read in many households, put into words for those unlearned in the law fundamental notions as to the character of the Union and the government. Hayne's able speech made no small impression at the South; and yet, when South Carolina, two years later, sought to put into practice the principle of State sovereignty, many of the Southern States declared her theories unsound and revolutionary. The full theory of State sovereignty and the doctrine of nullification was put forward by John C. Calhoun and exhibited in the State papers of South Carolina in declaring null and void within its limits the new tariff of 1832, which had been passed in place of the "abominable" act of four years before. Reduced to their lowest terms, Calhoun's theories, which were not improved in the 30 years that elapsed before they were tested on the battle-field, amount to this: The Union was a union of States, the Constitution not a law but an agreement between States; each State, being possessed of sovereign authority, must have the ultimate right to judge as to the validity of laws passed by the national government; an attempt to enforce a law declared null by a sovereign State would justify the State's retiring from the Union. These principles Calhoun declared constitutional and preservative, not destructive. The attempt of South Carolina to nullify the law of 1832 and prevent its enforcement was in part successful. Andrew Jackson, the President, a Western man without sectionalism, announced that the Union must be preserved and was ready to subdue rebellion by force. But after delay and much discussion, Congress passed two bills, one a force bill, the other providing for the gradual diminution of the tariff rates in the course of the succeeding 10 years. South Carolina withdrew her nullification ordinance; if she had not won all, she had given an example of what bold assertion might accomplish.

Before speaking further of the events of Jackson's administration (1829–37) into which the discussion of the tariff and of Southern objection have led us, we should return to the movement which caused the election of Jackson and accounts for some of the problems of his time. In 1824 there were four Presidential candidates, Crawford of Georgia, Clay of Kentucky, Jackson of Tennessee, and John Quincy Adams of Massachusetts. Crawford was the "regular" candidate, but no one received a majority of the electoral vote, though Jackson had more votes than any other. The House, on which the choice devolved, elected Adams, partly because of the influence of Clay; and there was at once an outcry, heightened when Clay became Secretary of State, that a corrupt bargain had been made between Clay and Adams. It was said, too, that the will of the people had been violated by the failure to elect Jackson. The frontier general, therefore, "Old Hickory," a downright man of primitive instincts and native keenness, was chosen in 1828 as a popular representative. The National Republicans, who were now led by Clay, in the course of a few years were known as Whigs, a name adopted as a protest against the high-handed methods of Jackson. The Democratic-Republicans, shouting for Jackson and victory, were soon known as Democrats. The party continued for years to hold the confidence and win the suffrages of the people. Except at two elections, from 1828 until 1860, the Democrats were successful in electing their Presidential candidate. With Jackson, elected as he was, and borne in with acclaim as the man of the people, came a strong Western aggressive spirit; and with him, too, the spoils systems, which was partly a frontier denial of the need of expert service, partly a sordid desire for place, partly a protest against an official class which some vaguely thought undemocratic. Jackson was naturally opposed to the national bank, and toward the end of the first term of service came (1832) a great controversy over the rechartering of that institution, whose corporate existence was to end in 1836. A bill for rechartering was vetoed by the President. The followers of Clay denounced the veto, declared it usurpation and appealed to the people at the polls, only to be once more defeated. The next year Jackson decided that the government moneys should no longer be deposited in the national bank, and this, the famous "removal of the deposits," was the occasion of great excitement in Congressional circles and of much recrimination in political oratory. But Jackson's cause, wise or unwise, was successful; the bank was not rechartered, and the State banks continued for some years to hold — when they did not lose — the national funds, which were, at a later time, transferred to the independent treasury. The State banks meanwhile, stimulated by a lust for Federal deposits, grew surprisingly in number, though

their available capital and special holdings did not correspondingly increase. The crude treatment of the delicate matter of finance, a treatment not unnatural for a frontiersman, may have had some influence in bringing on the panic of 1837, which ensued as Van Buren, Jackson's successor, took the Presidential chair. Van Buren, as Jackson's heir, had to bear the odium of the hard times that followed; but in fact the financial disasters were deep-rooted and were an inevitable consequence of the wild speculation that had been in vogue for years, during which men, otherwise not devoid of sense, bought wild land with reckless confidence in immediate rise in value, and plotted towns on paper as if intention would by force of sheer desire transmute wishes into wealth. For three years and more the country suffered the pangs of commercial depression and, of course, in 1840 elected a Whig as President—William Henry Harrison, like Jackson a frontiersman, whose humble log-cabin was set up as a symbol of true, simple Americanism, as over against the luxury of Van Buren, who was charged with habits of obnoxious aristocracy. The Whigs had indeed taken a shaft from the Democratic quiver, and the thousands that gathered at the mass-meetings to shout for "Old Tip," as Harrison was called, were living proof that the day had gone by when the Whigs, even in conservative New England, could look askance at the Democrats as just a little below the proper social standard. For this the election of 1840, a time of shout and doggerel verse, of assertive and empty oratory, deserves notice in our political annals. It marks the final disappearance of any pretense on the part of either political party to stand above and aloof; it marks assuredly the time when the spirit of confident Jacksonian democracy was, in politics at least, the settled spirit of the nation. The frontier, "the most American part of America," had completed its conquest of the whole.

The Jacksonian period deserves a word dissociated from political manœuvre. It was a time of physical and economic growth. New inventions found application in industry and multiplied the products of labor. New channels and new methods of transportation were put into use. When the Erie Canal was opened in 1825, the cost of transportation from Albany to Buffalo was greatly reduced. The steamboat, first used just before the War of 1812, had been of immense importance in building up the West, where the river system was especially adapted to the flat-bottomed steamers; but before 1840 steamships were crossing the ocean, offering facilities for the great tide of European immigration. The first steam locomotive built in the United States was built in 1825; in 1840 there were nearly 3,000 miles of railroad in operation. The emigration to the West went on at a rate more marvelous than before; population pushed on beyond the Mississippi, while such States as Illinois doubled and redoubled their population, and the little cluster of houses near the head of Lake Michigan began its rapid growth into the big, teeming city of Chicago. In intellectual and moral lines the American people were awake. New works of literature were written; new movements for public improvement and reform were undertaken; and with these manifestations of the humanitarian sentiment was a tendency, too, toward ideals, toward "soaring away," as Carlyle wrote Emerson, "after ideas, beliefs, revelations and such like, into perilous altitudes."

When such a spirit was abroad, when men were planning reforms and taking a new outlook on life, it was natural that some one should protest against slavery. Garrison founded the *Liberator* at Boston, and demanded the immediate abolition of slavery. The American Emancipation Society was soon formed. The extreme abolitionist, denouncing slave-holding as a crime, would consider no means to the end he desired, but insisted on the freedom of the blacks. Soon he was proclaiming the Constitution as "a covenant with death and an agreement with hell," and announcing that he would have no dealings or political communion with slave-owners. The South wrought up to a strange pitch of excitement acted with indiscretion; at least its voluble representatives were indiscreet enough; for the abolitionists were but a handful, and nothing served so well to bring them into notice and ultimately to give the anti-slavery cause standing as the vehement denunciation by the Southern men in Congress. Worst of all for the South, as it soon proved, effort was made to strangle free speech in Congress and to check the right of petition, an effort which resulted naturally in a heated discussion whenever the forbidden subject was mentioned, and increased by many thousands the number of anti-slavery petitions demanding abolition in the District of Columbia, or like measures. Finally the gag policy was abandoned, but it had accomplished an object the reverse from that intended. By 1840 an anti-slavery party, the Liberty party, was in the field, and the political movement which ended with the electinon of 1860 was begun.

Soon after 1840 arose interesting questions from which trouble ultimately came. Sometimes tariff and financial problems were under discussion, sometimes internal improvements and the dredging of rivers and harbors, sometimes matters of diplomatic concern; but underneath everything, though it did not always come to the surface, was slavery and the divergence of North and South. In 1836 Texas became independent of Mexico and asked for admission into the Union. Her separate existence was recognized by sending a minister from Washington; but there was for a time no serious movement for annexation. In 1840 Harrison and Tyler were chosen as President and Vice-President. Harrison died soon after the inauguration (1841). Tyler, though elected on a Whig ticket, was by training and predilection really more in sympathy with the tendencies of the Democratic party than with those of the Whigs. He did not participate with the Whig leaders in their movement to carry out their plans in regard to a new tariff and a new bank; and before the end of the term he had installed Calhoun as his Secretary of State. An effort to bring Texas into the Union had now begun, but a treaty prepared to attain that end was rejected by the Senate. In 1844 the Whigs nominated Clay; the Democrats, Polk of Tennessee. Polk's adherents shouted for the tariff of 1842 and demanded the "reannexa-

tion of Texas," referring by these well-chosen words to the fact that by the treaty of Spain in 1819 we had surrendered our claim to the land beyond the Sabine. The Liberty party, taking a strong stand against slavery, cast a much larger vote than four years before. Polk was elected; and under the influence of the election, the gloom of the Whigs and the enthusiasm of their successful opponents, the annexation of Texas was consummated (1845). The new State was brought in, not by a treaty as in the case of the acquisition of Louisiana and Florida, but by virtue of a joint resolution authorizing the President to invite Texas to come into the Union as a State. Texas was a slave State; her admission into the Union had been vehemently opposed by many Northern people because it increased slave territory and strengthened the hold of slavery on the land. Difficulties soon ensued, for Mexico was quite unwilling to surrender all the territory Texas claimed as hers and which we purported to have made our own. The new State claimed all the land from the old southwest boundary of the Union to the Rio Grande River. An effort to support the claim of Texas involved us in war with Mexico, a war which was not distasteful to Polk, who hoped it could soon be ended and that as a result he could obtain the Far West stretching away to the Pacific. The war (May 1846–February 1848) was a long triumph for American arms, longer than Polk could have wished, but triumphant none the less. In September 1847, General Scott entered the City of Mexico, and the next February was signed the Treaty of Guadalupe-Hidalgo, by which the United States secured the land westward to the ocean, and promised, besides assuming certain claims, to pay Mexico $15,000,000. There were thus added to the expanding republic, if we include Texas as the fruit of the war, about 875,000 square miles. In the meantime a treaty with Great Britain had been signed. The title of the United States to the Oregon country south of the 49th parallel was thus made secure. In 1853, by the Gadsden Purchase, something like 45,000 square miles — the southern portion of what became the territories of New Mexico and Arizona — were added to the national domain.

But the annexation of Texas and the new West immediately ushered in new difficulties. Even before the war was over there had come up in Congress the so-called Wilmot Proviso, the purpose of which was to exclude slavery from any land acquired from Mexico. In the election of 1848 Gen. Lewis Cass of Michigan, the Democratic candidate, was opposed by General Taylor of Louisiana, one of the heroes of the war. The Free-soil party (q.v.), the successors of the Liberty party, presented Van Buren and Charles Francis Adams as their candidates. They believed that Congress was legally bound to forbid slavery in the Territories, having, as they said, "no more right to make a slave than to make a king." Of these parties, the first two did not proclaim definite opinions as to slavery. Cass had, however, already announced that, in his opinion, the people of the Territories should settle their domestic affairs for themselves, a doctrine which was later formulated as the doctrine of "popular sovereignty." The Whigs as a party were not opposed to slavery; they counted on Southern support and sympathy; but many of their Northern adherents, "the conscience Whigs," were strongly opposed to extension of the system. The extreme proslavery element in the country believed that Congress could not rightfully prohibit the Southern slave-owner from moving into the national domain with his human chattels and holding them there as his own. Taylor was elected; the Free-soilers, no longer an insignificant faction, polled over 290,000 popular votes and held the balance of power in some of the States, actually casting more votes in New York than the Democrats.

There were by this time many plain manifestations of the growing estrangement between the sections. There was indulgence in charges and countercharges. The South complained of the escape of slaves, the North of the Southern effort to extend slavery and of the existence of slavery in the District of Columbia. Religious denominations began to divide along sectional lines, and there were still other evidences that in many respects the Union was legal, political and formal, that harmony was passing away. And yet, though perhaps the Southern people were in large measure united in defense of slavery, the great body of men at the North were not ready to act in unison in opposition to slavery or its extension. Not yet could the Free-soil party come near controlling either house of Congress. In the South the radical element had begun to talk of secession. Soon after the election of 1848 several matters demanded immediate attention. California, where gold had been discovered, was being rapidly peopled; the inhabitants formed a constitution excluding slavery and asked admission to the Union. Some form of Territorial government was needed for portions of the West, and some answer must be made to the demand for abolition of slavery in the District and to the complaints of the South. Henry Clay introduced into Congress a series of propositions which furnished the foundation for the compromise of 1850. California came in as a free State; the slave-trade was abolished in the District of Columbia; a rigorous fugitive-slave law was passed; New Mexico and Utah were organized as Territories without restriction as to slavery. In this compromise many hoped to see an end to sectional bitterness, but in vain. Before the compromise was passed, Taylor died and was succeeded by Fillmore. For a time, indeed, there seemed to come a lull in the storm, and men breathed more freely. Both of the leading parties in the election of 1852 announced their adherence — one may say devotion — to the compromise as a settlement of the slavery question. The Free-soilers did not yield their ground, but they cast fewer votes than four years before. Franklin Pierce, the Democratic candidate, was chosen; General Scott, his opponent, received only 42 electoral votes out of the total 296.

But the cause of free soil was nearer consummation than ever, for the direful subject of slavery could not be compromised away. Efforts to enforce the Fugitive-Slave Law met with resistance in some parts of the North, and the smuggling of the blacks by the Underground Railroad went on more briskly and

cheerily than ever. And then came the Kansas-Nebraska bill (q.v.), introduced by Senator Stephen A. Douglas (q.v.) of Illinois, and defended with all the vigor and vehemence of which he was master. It was passed in 1854, and the notion that compromise had cast a permanent benign influence over the nation was shattered. The bill provided for the organization of two Territories in land covered by the provisions of the Missouri Act of a generation before, and both of them north of 36° 30'. The Missouri Compromise was repealed and — in accordance with the principles of popular sovereignty — slavery was to exist in the Territories or be excluded as the people of the Territories might determine. For many Northern people, willing to acquiesce in the compromises, which they hoped had settled all dispute, the Kansas-Nebraska Act was a rude awakening. The Republican party was formed, absorbing the Free-soilers, winning new adherents to the anti-slavery cause and protesting against the extension of slavery into the Territories. In the autumn elections of 1854 this party made a showing of remarkable strength, but in 1856 the Democrats were once more successful, placing James Buchanan in the Presidential chair. Only one national party remained; the support of Fremont, the Republican candidate, was practically altogether from the Northern States.

From this time on there was little peace. In 1857 the Supreme Court, in the case of Dred Scot v. Sanford, declared that Congress had no right to exclude slavery from the public domain. In 1858 Abraham Lincoln, in a series of debates with Douglas, while both were candidates for election to the Senate, disclosed, with pitiless logic and with plain, unembellished phrase, the incongruity between popular sovereignty and slavery. If the Supreme Court was right, the slavery issue could no longer be avoided by adhering to the notion that the people of the Territories could exclude slavery if they chose; they could not lawfully exclude an institution that had the lawful right to exist within their limits. Lincoln thus inserted the wedge that split the Democratic party. In 1859 John Brown (q.v.), with some ill-defined hopes of doing service to the slaves, further embittered the South by invading Virginia. The Southern people, inspired by fear of a servile revolt, were aroused to great indignation, and the Northern abolitionists, with whom were classed all Republicans, were accused of plotting against Southern safety. The time was near at hand when only blows, not words, could settle the great question at issue between the sections, daily growing more hostile. In 1860 Abraham Lincoln was chosen President; the Republicans were successful, and South Carolina began preparations for setting herself up as a separate nation. State after State at the South adopted ordinances of secession. Through the winter of 1860–61 there was little opposition to the movement. Even many Northern men, strongly anti-slavery in sentiment, doubted the wisdom of "pinning" one section to the other by bayonets. Attempts at compromise — the Peace Convention, the Crittenden resolutions — were failures. Lincoln, a man almost unknown to the great body of the nation, paid close attention to the events of the winter, and when he took the oath of office in March 1861, spoke firmly. He asserted the illegality of secession, and declared that the Union was unbroken and the laws must be executed.

War began when the Confederate forces fired on Fort Sumter in Charleston Harbor. Lincoln called for 75,000 volunteers, and there was immediate response at the North. Events now moved rapidly. Following the lead of South Carolina, 11 Southern States formed the Confederacy. Kentucky, Maryland, Delaware and Missouri, border States with slavery, did not join the Confederacy. On 19 April Lincoln declared the blockade of the Southern Coast. On 13 May England proclaimed her neutrality. Richmond, Va., had become the capital of the Confederacy, and at the North rose the cry, "On to Richmond!" The complete defeat of the Union forces at Bull Run 21 July 1861 revealed to the North the magnitude of the task undertaken. The South had in some ways the advantage at the outset, for the North was the invader, and the South defending its own soil. The task of conquering a country as large as the Confederacy was enormous. Moreover, during the early years of the war, the Southern armies were more ably led and there was less confusion of counsels. Robert E. Lee was one of the most skilful generals of history, and not till the war was more than half finished did the North find Grant, Sherman, McPherson, Sheridan as the equals of Lee and his efficient lieutenants. But, in the long run, the North was destined to succeed because it was stronger, because in the contest for supremacy between free and slave labor the South had been hopelessly beaten; and thus the contest on the battlefield but made plain with arms what the economic forces had already accomplished. The North had more men, more wealth, more vigor to put into the conflict. The South, raising cotton, which was indispensable to the industrial interests of Europe, hoped and expected European intervention, but did not secure it. The belligerent rights of the Confederacy were recognized, but its separate independent existence was not. The coast of the Southern States was declared in a state of blockade, and the Federal government began the enormous task not only of fighting on the battlefield, but of surrounding and strangling the uprising against its authority. In the West the Northern armies, though not always successful, pushed the Southern forces slowly before them. In July 1863, Vicksburg surrendered to Grant. Shortly after the Confederates inflicted decisive defeat on the Union forces under Rosecrans at Chickamauga. In the autumn the victory at Chattanooga, where Grant, ably supported by Hooker, Thomas and Sherman, overwhelmed the Confederate forces, was a crushing blow for the Southern cause west of the Appalachians. The next year Sherman entered upon an aggressive campaign, taking Atlanta and then marching through Georgia to the sea. But in the East difficulties seemed to multiply in the early years. Robert E. Lee of Virginia, aided by staff commanders like Jackson and Longstreet, seemed for a time absolutely invincible. Successful in defeating McClellan in the Peninsular campaign of 1862, Lee soundly whipped Pope near Bull Run the same year. Driven back from Maryland by McClellan, who attacked him at Antietam, he defeated Burnside at Fredericksburg, and Hooker the next spring

(May 1863) at Chancellorsville, and with a victorious army marched boldly into Pennsylvania, where he was repulsed by Meade at Gettysburg. The next year Grant, the victorious Western leader, taking command in person of the Eastern army, began his fearful "hammering" and led his men to ultimate victory. Lee surrendered at Appomattox 9 April, and the Confederacy collapsed in the spring of 1865. The energy of the free North seemed unabated; the South had been unable to supply Lee, its great commander, with men and supplies sufficient to meet the enormous weight of Northern arms, when wielded by a general of the first order.

At the close of the war the North had over 1,000,000 men in arms; the loss in battle and by disease had been great,—not far from 300,000 men. The Southern loss was presumably not much less. The expenditure of wealth had likewise been enormous; in fact, the real loss is incalculable, for no one could even estimate what the South had given up. When the war ended, the national debt was $2,850,000,000; and in the four years nearly $800,000,000 had been raised by taxation. The expense of the war of defeating the Confederacy was increased by the hesitation of the government to resort to adequate taxation and by the issue of legal-tender paper, a measure possibly justified by political considerations. In July 1864, gold touched 285, and this meant an excessive price for other commodities, which were in the long run paid for in good money. On the other hand, the establishment of the national bank system by the acts of February 1863, and of June 1864, greatly facilitated the government's control of the national resources.

At the beginning it was not thought at the North that the war was a war against slavery. In July 1861, Congress declared "the war is not prosecuted . . . for any purpose of conquest . . . nor for the purpose of overthrowing . . . the rights or established institutions of those States, but to . . . maintain the supremacy of the Constitution . . . and to preserve the Union with all the dignity, equality and rights of the several States unimpaired." But in the course of the struggle, slavery was doomed to fall. Foreign opinion and radical Republicanism alike demanded its destruction. Whatever might be said to the contrary, slavery had caused the war. On 22 Sept. 1862, Lincoln issued the Proclamation of Emancipation, declaring free all persons held as slaves within any State or parts of States in which the people should be in rebellion the following 1 January. But the Proclamation of Emancipation was a mere military order; its efficiency upon the ensuance of peace was, therefore, open to question. Moreover, it did not affect slavery in the loyal border States. In February 1865, the 13th Amendment was proposed to the various State legislatures, and the following December it became a part of the Constitution. The Civil War resulted in the freeing of 4,000,000 slaves, and in demonstrating the American Union to be, in the words of Chief Justice Chase, "an indissoluble Union of indestructible States."

Even before the war was over, the question had arisen as to how the Union could be reconstructed; in case the South was beaten, what steps should be taken to establish the Southern States once more in their constitutional relations? The early Republican theory had been that the States could not secede, and hence it could now be logically argued that the States, having never gone out, were still in the Union. Lincoln's theory was not inconsistent with this idea; to him the task of Reconstruction was not to restore the States, but to see that the governments were in the hands of loyal men who would do their duty as citizens of the United States The assassination of Lincoln, 14 April 1865, brought sorrow to millions of devoted people at the North. His successor, Andrew Johnson, was not well adapted to the difficult and delicate work that lay before him. On the one hand was a distracted South, overwhelmed with defeat; on the other was a triumphant North made up of different factions (1) the radical Republicans, whose antagonistic spirit had been aroused by conflict; (2) the extreme advocates of negro rights like Charles Sumner, who acted in most respects with the radical partisans; (3) a number of men who had been acting with the Republicans but whose antecedents were those of the Democracy or whose inclinations held them with fragile threads to the Republican party; and (4) lastly the Democrats, who were strong in opposition. Johnson could not possibly hold together the elements on which he must rely. The fault was not altogether his; the situation was replete with difficulties. And yet, if ever a nation needed wisdom and unselfish service rather than partisan bitterness and strife, it was during the trying years of Reconstruction that followed on the heels of Civil War. Lincoln had (July 1864) refused to sign the Wade-Davis bill, which proposed a plan for Congressional participation in the process of Reconstruction. Johnson, like his predecessor, believed that Reconstruction could be accomplished by executive methods. In May he issued an Amnesty Proclamation. By December the governments of most of the Southern States had been established in accordance with the Presidential plans, which practically put the States in the hands of those willing to take the oath of allegiance. Representatives came to Washington from nearly all the Southern States. But the process of Reconstruction was not to be so easy. Already Sumner had given utterance to his State-suicide theory, the theory that a State by virtue of rebellion lapsed into the condition of a Territory. Thaddeus Stevens had announced the conquest theory, in accord with which the South was to be looked on as conquered territory and treated as such by Congress. Members of Congress were not ready to turn the problem over to the President, and little by little the breach between the two departments of the government widened. The Democrats supported Johnson's plans, the Republicans opposed, and soon the President and the leaders in Congress were bitterly hostile. By degrees the enmity between Johnson and the Republicans became so bitter that he was impeached for venturing to disregard the Tenure of Office Act by removing Stanton, the Secretary of War. The Senate failed to convict him.

There was a number of acts passed by the Southern legislatures which appeared to Northern people to be attempts to avoid the 13th Amendment and reduce the negroes practically to slavery once more. A joint committee on Recon-

struction now took charge of affairs, and the legislative branch of the government, passing important measures over the President's veto and denying the Southern States representation in Congress until certain demands were met, controlled the situation completely. The purpose of the Republican leaders was to give predominance to the «party of the Union» in the South. The Freedmen's Bureau had already been established to care for the freedmen. The Civil Rights Act was enacted; and soon after, the 14th Amendment was submitted to the States for adoption (June 1866).

With the exception of Tennessee, the Southern States refused to ratify the amendment, but their refusal was of no avail; the South was put under military government, and no State was admitted to representation until it had accepted the amendment. In 1868 the measure was adopted; it was of immense importance. Under the original Constitution, the liberty of the individual was in nearly every respect in the hands of the State; by the 14th Amendment it was declared that no State should «deprive any person of life, liberty, or property, without due process of law, nor deny to any person within its jurisdiction, the equal protection of the laws.» It also provided that there should be a reduction of representation of any State that abridged the right of male citizens 21 years of age to vote. The chief purpose of the amendment in this particular was to cut down the representation of those Southern States that did not give the ballot to the negro. Two years later the 15th Amendment was enacted, declaring that the right to vote should not be abridged «on account of race, color, or previous condition of servitude.» The last three amendments were the most evident constitutional products of the war. The last State to be admitted to the privileges of the Union was Georgia (July 1870). In the meantime conditions had been bad in the South. «Carpet-bag» governments had entered upon their work of wasting the substance of the already impoverished country. The Southern people began by all sorts of methods to throw off the burden of domination by ignorant negroes and dishonest whites. Some of the latter were indeed honest, but the results of «carpet-bag» rule were deplorable. Not until 1877 were the Federal troops withdrawn from all parts of the South and the Southern people suffered to manage their political affairs as they had done before 1861.

In 1868 General Grant became President. During his time the difficulties in the South continued and long gave no sign of real betterment. Only gradually was the trouble cleared away and a better feeling between the sections established. The most important fact of Grant's first administration was that Great Britain and the United States agreed, by the Treaty of Washington, to arbitrate the matters in dispute between them. During the war, the latter power had strongly objected to England's conduct in allowing vessels that were to be used to prey on Northern commerce to be fitted out in her harbors. The most noted of these was the famous *Alabama*, which, after doing immense damage, was sunk by the *Kearsarge* in a fight off the coast of France. The Court of Arbitration, which was provided for by the treaty, meeting at Geneva, awarded to the United States $15,500,000 as damages for the injuries inflicted. In the election of 1872 the Liberal Republicans appeared in opposition to the regular Republicans. They demanded reform in the administration of government and that the government cease its interference in the affairs of the Southern States. The movement marks the beginning of the gradual rearrangement of parties.

The Republican party had absorbed the Union element of the North and had attracted the support of even earnest war-Democrats; but confronted with new problems, now that slavery was gone and the Union intact, the party naturally could not hold all the persons whom the pressure of war had brought within its lines. The Democrats supported the Liberal Republican candidate, Horace Greeley, but Grant was successful. His second administration was marred by a number of serious official scandals — the Whisky Frauds, the Credit Mobilier, the Salary Grab — and there was a widespread feeling that all was not done to ferret out rascality. The panic of 1873 occurred; perhaps it was a natural result of the war; certainly it was not to be wondered at in the light of extravagant speculation in a country still burdened with a load of paper money. And yet, in spite of all the country had endured, its population and wealth had greatly increased since the outbreak of the war, and, notwithstanding evidences of a loose and even dangerous spirit in public affairs, the people had, on the whole, withstood remarkably the deleterious influences of long civil strife.

In 1876 Samuel J. Tilden was nominated by the Democrats and Rutherford B. Hayes by the Republicans. The election was hotly contested and when the ballots were counted the result was still in doubt. Twenty electoral votes were in dispute — one from Oregon and the remainder from South Carolina, Florida and Louisiana. Tilden had received, undeniably, 184 votes and needed but one to have the requisite majority. The situation, fraught with manifest danger, was without precedent, and one for which there was no adequate constitutional provision. By agreement between the Republican Senate and the Democratic House, an Electoral Commission was created, which determined the contest in favor of Hayes. The Democrats, with true patriotism, accepted the result with calmness. The new President, a man of sound judgment and fine character, by his frank and friendly conduct helped in the restoration of a better feeling at the South. The Federal troops, as we have already said, were withdrawn from the Southern States, and at the end of the administration much of the bitterness between the sections, which had lasted for a generation, had disappeared. The Republicans were again successful in 1880, electing James A. Garfield as President and Chester A. Arthur as Vice-President. The administration had scarcely begun when Garfield was shot, and he died in September 1881. Arthur succeeded to the Presidency and performed its duties with conservatism and good judgment. The administration was, on the whole, uneventful; the country was prosperous; the policy of resumption of specie payments had been adopted some time before and had been carried quietly into execution at the day set (1 Jan. 1879); the monetary basis of industry was good, even if not perfect; the im-

mense debt entailed by the war had been largely reduced; the revenue of the government was so large that a surplus had been created which presented its own difficulties. The foundation of better government was provided for by the establishment (1883) of a Civil Service Commission. In 1884 the Democrats nominated Grover Cleveland and the Republicans, James G. Blaine. There was considerable defection in the ranks of the latter party, for, while many persons gave the candidate enthusiastic support, others were unwilling to vote for him and announced their preference for Cleveland, who by his vigorous administration as governor of New York had won confidence and respect. The disaffection of the "Mugwumps," as the dissatisfied Republicans were called, proved to be a matter of some importance, for Blaine was defeated and the Democrats, for the first time since the election of Buchanan in 1856, placed their candidate in the Presidential chair. During Cleveland's term, and in a large measure because of the influence of the President himself, the tariff issue became paramount. The Republicans strenuously adhered to the doctrine of protection and discountenanced all efforts to reduce the revenue by a lowering of duties, while their opponents, declaring all unnecessary taxation unjust taxation, attacked the high tariff as unwise and harmful. This was the main question, therefore, in 1888, when Benjamin Harrison, the Republican candidate, was successful over Cleveland. Four years later, however, on a platform not very different from that of 1888, the Democrats, having nominated Cleveland for the third time, were successful. The years that followed were full of interest. A serious wordy altercation with Great Britain concerning the boundary of Venezuela was finally settled. In Harrison's administration a revolution had occurred in Hawaii and a treaty of annexation had been framed, but not ratified. Cleveland withdrew this treaty from the consideration of the Senate and announced that the American protectorate which had already been set up in the islands was at an end. The tariff question was the subject of much discussion and Congress passed, after much trouble, the Wilson bill, reducing the tariff in some degree, but satisfying neither party. In the spring of 1893 there were the beginnings of a disastrous financial panic; the monetary condition of the country was bad. In 1873 silver had been demonetized, but a few years later (1878) the Bland-Allison Act had provided for the government's purchasing and coining a limited amount of silver; in 1890 the Sherman Act was passed, by the terms of which silver bullion was to be bought periodically and paid for in treasury notes. The government thus was a heavy holder of silver, and there was doubt as to the ability of the government, under the circumstances, to adhere to the gold standard. In 1893, under the pressure of the panic, the Sherman Act was repealed, but trouble continued and not for some years was there a return of business prosperity. The hard times were doubtless, like the difficulties of 1837 and 1873, not altogether due to the state of the money of the nation, but to many other causes as well. In 1896 the silver question was thoroughly debated. William J. Bryan of Nebraska was nominated by the Democrats on a platform demanding the free and unlimited coinage of silver and gold at the ratio of 16 to 1. William McKinley was selected as the Republican candidate on a platform declaring opposition to the free coinage of silver except by international agreement. The campaign awakened great interest among all classes of voters and resulted in the election of McKinley by a large popular and electoral majority. In the course of the administration a new tariff law was passed and also an important act for the establishment of the monetary system. But of course, most important of all was the war with Spain, which ended in the independence of Cuba and the annexation of Porto Rico and the Philippines. The Hawaiian Islands, also, were annexed while the war was in progress. (See UNITED STATES — SPANISH-AMERICAN WAR). McKinley and Bryan were again in 1900 the candidates of their respective parties, and the former was again successful. McKinley was shot by an anarchist at Buffalo in September 1901, after his second inauguration, the third of our Presidents to meet death from assassination.

Upon the death of McKinley (14 Sept. 1901), the Vice-President, Theodore Roosevelt, assumed the Presidency. He had held official position of some prominence before this time, but he was still young, full of energy, enthusiasm and determination. All through the early years of the century he was a conspicuous and forceful influence in American life. His influence was in some ways more strongly personal than official, but, whatever the character or the source, it was marked. The years of his administration (1901–1909) coincided with a new comprehension of civil duty and of the tasks of government. Foreign complications were not particularly embarrassing, but, possibly because of their inherent importance, and possibly because of the open public way in which they were treated by the President and his able Secretaries of State, John Hay (to 1905) and Elihu Root (1906–09), people at large took an unwonted interest. Matters of social and political reform also received new attention; purely party controversy and animosity, at least among the people at large, appeared to drop into the background, while the essential problems of civil improvement came forward with new force. We should be guilty of an exaggeration and see things in a false perspective if we should declare that in the first 10 years of the century men first came to see the responsibilities begotten by the tremendous industrial development of the years since the Civil War, and we should likewise be misleading if we should assert that only then did they see the social problems that resulted from the immensity of production, the concentration of industry and the great increase of wealth; but certainly during those years men in general first gave serious thought to problems of this nature. There was deep and widespread interest in social reform and in political improvement.

The new interest and new discontent resulted in legislation affecting political methods and industrial conditions. The direct primary, which was first adopted as legal for all nominations by Wisconsin in 1903, was soon put into operation in many other States. Woman suffrage was also widely taken up and adopted, and the agitation was actively carried on throughout the country. The movement for a national income tax, which had been advocated

for some decades, resulted in the adoption of the 16th Amendment in 1913, authorizing the government to levy a tax on incomes without apportionment among the States. The discussion of the desirability of relieving the State legislatures of the task of electing United States senators ended by the adoption of the 17th Amendment in 1913, giving the power to the people, one of the results of a widespread belief that the people should have more immediate participation in their own government. The same general tendency was shown in the adoption of the initiative and referendum; some form of direct legislation was introduced into a number of the States, especially those of the West, and it appeared for a time as if the system would become almost universal. The recall of officials was also provided for in a few States, chiefly in the Far West. This method of controlling government by popular action was not, however, quite so favorably viewed as were the initiative and referendum, and there was specially deep-rooted objection to the recall of judges; in 1912 Mr. Roosevelt advocated the "recall of judicial decisions," the adoption of a system whereby the people could by some simple method "decide whether or not a judge's interpretation of the constitution is to be sustained."

Proposals to improve conditions of workingmen were widely discussed, and something was done in the way of legislation: the old common-law rule as to the liability of employers for injuries to workmen appeared to be unjust and wasteful as applied to conditions of modern industry; and compensation acts were established providing for payment in case of injury or death, even when the accident was due to fault or negligence of the workman. Plans for old age pensions for workers also received attention, but as yet little or nothing has been done by governmental action, though some of the larger corporations have voluntarily established pension systems. Serious consideration was given not only to factory conditions but to hours of labor, and laws were passed in some States limiting hours, especially those of women and children.

Of the early achievements of the Roosevelt administration first mention may be made of the Panama Canal. The experiences of the Spanish War, the new responsibility of the nation due to the annexation of Porto Rico and the independence of Cuba under our guardianship, made the building of the canal a matter of immediate concern. The United States soon after the war took up with England the abrogation of the Clayton-Bulwer Treaty, and in 1901–02, by the second Hay-Pauncefote Treaty such abrogation was provided for, and definite basis was thus made for the construction of the canal as an American enterprise. There was difficulty in coming to terms with Colombia, within whose bounds lay the route for the canal; but Panama opportunely revolted from Colombia and a treaty was made with the new state, whereby the United States became possessed of the canal strip. Preliminary work was begun soon after occupation, but it was some time before excavation was begun in earnest. The work was carried to successful completion in 1914 under the direction of army officers, who showed great engineering skill and administrative capacity. The expense was about $400,000,000. Some notion of the value and significance of the undertaking may be gathered from the fact that by the use of this waterway a voyage from New York to Japan was shortened some 4,000 miles, and from New York to San Francisco, 8,000 miles.

The annexation of Porto Rico, the Philippines and Hawaii brought new problems to the American government. Although the limits of the United States had been extended at various times in the past, the annexed territory — if we except Alaska — had been contiguous to the old, and had been largely unpeopled; as a consequence, such acquisitions did not bring up very serious or complex problems of adjustment. The slavery question, it is true, had in the earlier days complicated the task of establishing territorial government; but on the whole, from the time when the Ordinance of 1787 was adopted, there had been no difficult question as to the form of government to be set up on the new land, or of the relationship that should exist between inhabitants and the government at Washington; it was taken for granted that the territory, in accordance with the principles of the Ordinance of 1787, should be ultimately absorbed into the Union, and have all the rights and privileges of States. In the case of the new "insular possessions," no such expectation could well be entertained, and to add to the difficulties of the task, some little time elapsed before the Philippine Islands were brought safely under the sway of American authority. Because of the uncertainties of the Philippine situation, representative government was not accorded the people at first; but in 1907 an assembly met and from that time on acted with a commission, appointed by the President of the United States, as a legislature of the colony. In 1916 Congress passed an act declaring that the war with Spain was not a war of aggression and that it had never been the intention of the United States permanently to retain the sovereignty of the Philippines; a further step, therefore, was taken toward the establishment of full self-government in the islands by giving the people a right to elect a second legislative chamber and at the same time the Philippine commission was entirely given up. Soon after annexation (April 1900), civil government was set up in Porto Rico; the act of establishment provides for a governor appointed by the President, an executive council of 11 members appointed in the same manner, six of them to be heads of administrative departments and not less than five natives of the island, and an elective assembly to act with the council as the legislature. Hawaii's government has, from the beginning of American rule, been similar to that of the old well-known territorial type; the President appoints the governor, secretary and the judges of the Supreme and Circuit Courts; the legislature is composed of two houses, both chosen by the people. The condition of Cuba after the surrender of Spanish sovereignty demanded attention; for some three years the island remained in the charge of a military governor representing the United States, but in 1902 a constitution drafted by a convention went into effect, the authority of the United States was withdrawn and the new republic entered upon the interesting but difficult task of self-government. Once since the withdrawal, the United States has found itself com-

pelled to re-enter the island and restore order; but after doing so has restored authority to the Cubans.

The annexation of Porto Rico and of the islands in the Pacific, the development of trade, the growing complexity and intimacy of international relationships, cast in some measure a new light on America's position in the world and her responsibilities; it was not uncommonly said that America had become a world power. Probably America had been in every sense a world power for a hundred years, but still it is true that the new "possessions" and the new tasks called the people to a wider outlook on world politics and made it necessary to consider seriously what part should be played by the United States among the nations. It is probably true also that with the beginning of the new century the average man was less provincial and more inclined than before to speculate on the complexity of the world's affairs and the perplexing problems begotten by backward countries, trade ambitions and general tendencies toward imperial expansion.

The history of political controversy and discussion during the early years of the century was on the surface at least not so very different from that of previous decades; but, as we have already said, many subjects attracting wide public interest were not matters on which parties sharply differed; both parties contained progressive elements, and with the possible exception of the tariff, there appeared on the whole to be no very definite issue. As the campaign of 1904 approached it was apparent that, though Mr. Roosevelt had antagonized some of the old Republican leaders, his renomination was inevitable because of wide popular support; he was, therefore, nominated without opposition, Charles W. Fairbanks of Indiana being the candidate for the Vice-Presidency. The Democrats nominated Judge Alton B. Parker of New York and Henry G. Davis of West Virginia. They gave up the struggle for free silver, for their candidate was strongly opposed to the principle; they attacked "protectionism," spoke out strongly against "gigantic trusts" and advocated the independence of the Philippines in accord with the principles of anti-imperialism. In the course of the campaign the Democratic candidate made serious charges to the effect that large contributions had been made by wealthy corporations to the Republican treasury, and implied that the party and its nominees were put under obligations to the donors. These charges were denied; but the whole controversy stimulated the movement for the enactment of corrupt practices acts, such as were afterward passed by the national government and some of the States. The Republicans were successful in the election, with an electoral vote of 336 as against 140 polled for the Democratic candidates, and with a popular plurality of over 2,500,000.

Before the coming of the next election conditions were considerably altered; opposition to trusts and to "big business had increased; there were demands in various quarters for laws for social betterment and relief; and the increasing cost of living, which was credited in part to the tariff and the favoritism shown to certain industries, had awakened much complaint. Not much of this unrest found expression in opposition to Mr. Roosevelt, who was classed with the progressive element of his party as against the "stand patters" who disapproved change or recession, especially on the tariff. The Republican nominees in 1908 were William H. Taft and James S. Sherman. Mr. Bryan and John W. Kern were the Democratic candidates, the former still appearing to be the leading and most influential person in his party. The Republicans, influenced by popular unrest, declared "unequivocally for the revision of the tariff by a special session of Congress immediately following the inauguration of the next President," and favored the development of a permanent currency system and the greater supervision of corporations engaged in interstate commerce, while the Democrats explicitly demanded reduction of the tariff and emphatically advocated stringent control of trusts and railroads. Once more the Republicans were successful, though by a somewhat smaller electoral majority (321 to 162) than four years before and by a greatly reduced popular majority, less than 500,000 votes. The next four years were full of restless disputation. As they had promised, the Republicans took up the tariff question and passed the Payne-Aldrich bill; but the results were decidedly unsatisfactory to those who had expected a "revision downwards," and there was in some quarters a feeling that the public had been betrayed, that once more the tariff had been manipulated, not really lowered, or handled with reference to the needs of the consumer as well as the manufacturer. This feeling was not confined to those who were traditionally associated with the Democrats or to those who had been consistently tariff reformers. For this reason, and probably because of more vague causes of discontent, the party was defeated in the Congressional election of 1910 and lost control of the House.

For some years past the progressive or insurgent element in the Republican party had been growing in strength; unwilling to leave the party, these persons nevertheless struggled against the control of those who had been dominant in its councils and had commonly marked out its policy. It might be said that during these years the progressive elements of the two parties — for the Democratic party was also by no means at peace — appeared to the onlooker to have more in common than did the varying elements in any one party. The "insurgents" in Congress took a determined stand against some pieces of Republican legislation and were successful (1910) in reducing the power of the speaker of the House, who had great influence on legislation and was thought to use his power to prevent free discussion or the free development of party programs and policies in legislation. There were various other evidences of dissatisfaction with the old régime in politics, many believing that President Taft, though thoroughly honest and right-minded, was under the influence of reactionary forces when he ought to be pushing the party forward. The truth seems to be that he was earnestly seeking to hold the elements of the party together, but he probably did not fully appreciate the depth and vigor of popular dissatisfaction, and especially the objection entertained to the seeming sway of certain men whose names, rightly or wrongly, were associated in the public mind with mechanical

politics and subservience to unpopular interest.

The result of this condition of affairs was shown at the opening of the campaign of 1912. Roosevelt, who had strongly favored the nomination of his successor four years before, now came out against him, became a candidate for the nomination and was enthusiastically supported by a large portion of his party. Before the Chicago convention met, it was apparent that reconciliation between the warring elements in the party was almost impossible. The meeting was, however, held securely in the hands of the old practised leaders, who were vigorously denounced for using what were called "steam-roller" tactics to crush out opposition and name their own candidate. When Taft and Sherman were nominated over the vehement protest of the Roosevelt followers, the insurgent elements, who were already calling themselves "Progressives," met in convention (Chicago, August) and nominated Roosevelt and Hiram W. Johnson. The Democratic party had its own difficulties, for there also contending factions struggled for control. The outcome, however, was not a breach in the party but acquiescence in the nomination of Woodrow Wilson and Thomas R. Marshall, who represented the more progressive wing. Under such circumstances there could be no real chance for either Taft or Roosevelt; but the campaign was carried on with great earnestness and much public discussion had the usually beneficial effect of arousing public attention to vital matters. Wilson and Marshall were elected, receiving 435 electoral votes out of a total of 531, but only a minority of the popular vote (6,286,214 out of 15,031,169). The Progressives cast over 4,000,000 votes, over 500,000 more than the Republicans, who secured only eight electoral votes. In the Congressional elections the Democrats were also successful, gaining control of both houses; but the Progressives made no such exhibition of strength as in the vote for President; the Congress of 1913–15 contained only nine Progressives and seven members commonly classed as Progressive Republicans.

Soon after the inauguration of Mr. Wilson Congress under his guidance took up a number of important matters. A new tariff bill was passed, extending the free list and lowering duties. To make up for the decrease in revenue an income tax was provided, including the principle of graduation. A currency bill, providing for a Federal reserve bank system, was also enacted. Other important measures in accord with the Democratic program were put on the statute books.

The outbreak of the World War in the summer of 1914 brought many perplexing and difficult problems; the United States, seeking to maintain its rights and to fulfil its duty as a neutral state whose citizens were deeply stirred by the war and whose interests, commercial and personal, were strongly affected, found it no easy task to assert and uphold its rightful position. English commercial policy, which purposed to prevent all trade with the enemy, even trade passing through neutral countries, brought forth objection from the American government; and on the other hand there was on more than one occasion serious danger of war with Germany because of the destruction by German submarines of British passenger ships carrying American citizens. The trouble with Germany and Austria was acute and fraught with danger of war from the time of the sinking of the *Lusitania* in the spring of 1915, and in February 1917 diplomatic relations with Germany were broken because of the declaration of that nation that vessels coming within a war zone which she marked off would be sunk without warning and without restraint. To add to the anxiety and perplexity of these trying years, our relations with Mexico were strained almost to the breaking point. During the later years of Mr. Taft's administration Mexican conditions presented serious difficulties, but soon after Mr. Wilson's accession the situation became acute. Various factions strove for the control of the government, lawlessness prevailed, bandits sought their prey; American property was destroyed and American citizens murdered. In 1916 a band of outlaws crossed our border and killed several unoffending persons. At the beginning of his administration President Wilson announced a policy of friendly regard for the countries of Latin America and disclaimed any desire or intention to acquire further territory; this policy he earnestly strove to fulfil; but in the spring of 1916 a force was sent to Mexico to hunt out the archbandit Villa and to punish those who had invaded our territory. In the early summer the State militia was called out and some of these troops sent to the Mexican border. The Great War in Europe and the trouble with Mexico called the attention of the American people to miliary matters; and the average citizen questioned whether the navy was strong enough to defend the coast in case of attack, or the army large enough to defeat invaders. There was strong demand for "preparation," and Congress passed measures providing for a large increase in the army and for a greatly enlarged navy.

While making provision for the great expenditure for military purposes, Congress declared that the United States "looks with apprehension and disfavor upon a general increase of armament throughout the world, but it realizes that no single nation can disarm, and that without a common agreement upon the subject every considerable power must maintain a relative standing in military strength."

In 1916 the Democrats nominated Wilson and Marshall once more; the Republicans named Charles E. Hughes and Charles W. Fairbanks. Mr. Roosevelt was nominated by the Progressives, but declined to be a candidate and advocated the support of Mr. Hughes. The issue of the election did not appear at first to enlist the acute attention of the people, but before the end there was widespread interest and enthusiasm. It is hard to say in a word what was the chief or controlling issue of the campaign: Republicans charged the Democrats with executive mismanagement, and in the later weeks of the campaign recurred to the tariff, declaring that the great business prosperity of the country was produced by the war and would be succeeded by a hopeless depression if sufficient protection were not provided. President Wilson himself was the centre of attack; and some speakers, notably Mr. Roosevelt, condemned his Mexican policy and his failure to take more decisive and aggressive

action in dealing with Europe, especially Germany. Mr. Wilson's supporters ably defended his administration as high-minded, progressive and constructive, and asserted that his attitude and action with regard to the trying problems of diplomacy were wise and patriotic. In the midst of the campaign a sudden strike of railroad employees was prevented by the passage of a Congressional act, on Mr. Wilson's recommendation, establishing an eight-hour day on interstate railroads for certain classes of employees. The President at the same time made additional recommendations which contemplated, among other things, making it unlawful to bring on a strike or a lockout before public investigation of conditions; but these recommendations were not at that time made into law. This labor problem and Mr. Wilson's action greatly complicated the discussions and the course of the campaign; for some persons strongly condemned, while others as vigorously defended, the steps of the administration in this particular emergency, and it is impossible to determine whether the President's responsibility for the eight-hour measure (the Adamson Act) aided him or reacted unfavorably. The result of the election showed, on the whole, something of a sectional variation, although even in the East, which was generally strongly Republican, New Hampshire, by a very small plurality, chose Wilson electors. Ohio broke the solid vote of the Old Northwest by casting its vote for the Democratic candidate, while many of the Western States, including California, added their votes to those of the South, and thus determined the election in Mr. Wilson's favor. The Democratic candidate was supported by every State west of the Mississippi except Iowa, Minnesota, Oregon and South Dakota. In Minnesota the popular plurality was small, not far from 400. The electoral votes of the States carried by Mr. Hughes numbered 254; those carried by Mr. Wilson, 277; the Democratic plurality in the popular vote was over 450,000.

The history of the Great War in Europe and the forces that finally drove the United States to participate in that war have been told in other articles of this volume. That story need not be repeated here. We need only to remember that in April 1917, after prolonged attempts to maintain American rights by diplomatic protests and expostulations, President Wilson went before Congress and advised that Congress declare the recent course of the imperial German government to be in fact nothing less than war against the government of the United States. War was formally declared 6 April. Provision was soon made for the raising of an immense army, partly by calling the National Guard to the colors and also through the processes of a selective draft; training camps for officers were hastily built, and by the middle of May were filled with some thousands of eager young men. Money was voted lavishly for airplanes and various other things that modern warfare demanded. A few men were sent to Europe early in the summer of 1917, but it was the spring of 1918 before they were sent in large numbers. The American soldiers helped to stop the fierce drive of the Germans against Paris in the early summer of that year, and in the autumn they brilliantly executed plans for the seizure of the San Mihiel salient. In September American forces began the Meuse-Argonne offensive, the greatest connected series of engagements in which American soldiers have ever been engaged. Largely because of the courage of our troops and the terrific weight of the American armies which during these autumn months were hurled against the German line, the enemy were driven back until utter and overwhelming defeat stared them in the face. They applied for an armistice and on 11 November the terms of the Allies having been accepted hostilities came to an end. Soon after this President Wilson himself crossed the Atlantic to Paris to represent, with four others, the United States at the Peace Conference. The Treaty of Peace with Germany was presented to the delegates of that country at Paris 7 May 1919 and after some delays and discussions was signed by the Germans. The treaty included, among other things, a provision for a league of nations in which America was to participate, and the terms of this treaty were subject to continuous discussion, not only in the Senate, when the ratification of the treaty was under discussion, but also in the country at large. The organization of the world to prevent war and to secure and develop peace had been proposed a number of times, especially from the beginning of 1916, and in various papers and speeches President Wilson had presented the desirability or necessity of such a consummation as the end, or perhaps the justification, of the whole struggle. The difficulties in reaching a decision on the acceptance of the treaty and the League of Nations were enhanced by the elections of 1918. The Republicans obtained control of both houses of Congress, and there were consequent difficulties arising out of the party system in the way of hearty co-operation between the President and congressional leaders.

Among the most important internal political developments in recent years are the addition of three new amendments to the constitution of the United States. The 16th amendment, already mentioned, gave Congress power to lay and collect taxes on incomes, from whatever source derived, without apportionment among the several States: in other words, Congress, in levying an income tax need no longer be bound by the clause in the constitution referring to "direct taxes." In the same year the 17th amendment was adopted, providing for the popular election of senators. By the early part of 1919 the 18th amendment providing for a national prohibition had been adopted by the requisite number of States and pronounced a part of the constitution. In accordance with the authority granted by the 16th amendment, an income tax law was passed by Congress, and during the course of the war a very large share of the government revenue was obtained in this way. One of the problems facing the United States at the end of the war was dealing with this subject of taxation, and especially of direct taxation on incomes. The whole economic problem of reconstruction occupied the attention of the people in the year after the close of actual hostilities. The government had taken charge of the railroads of the country not long after our entrance into the conflict and the economic perplexities resulting from the rise of prices and the increase of wages greatly augmented the difficulty of the economical man-

agement of the railroads and added to the intricacies of the whole national railroad problem.

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3. CAUSES OF THE REVOLUTION.

The political and constitutional relations between Great Britain and the English dominions in America in 1760 were ill-defined, and fundamental understanding between the English communities on the two sides of the Atlantic as to the essential qualities of the connection was lacking. In England an act of Parliament had come to be regarded as the highest expression of power within the Constitution and the range of subjects over which Parliament's power extended was unlimited. In America the full consequences of the omnipotence of Parliament were obscured by the fact that its power had been actually exercised over the colonies only for the purpose of establishing, protecting and maintaining a commercial system of imperial extent and character, and in a manner which left the internal concerns of each colony largely under the direction of its local government. The superintendence of the colonial governments was in the hands of the Crown, under whose administration a considerable degree of local autonomy had been attained. The situation was further obscured by the fact that within the very realm of commercial regulation, which constituted so large a part of the region of the exercise of Parliamentary power, the administration was notoriously inefficient. So that in the generation before George III, the system remained largely unexploited by Parliament and its true character and possibilities unappreciated by the Americans. Under these circumstances, it is evident that, if, after a long period of indeterminate relation, the issue as between Parliament and the colonies should be raised at all, much would depend upon the manner of its raising and on the circumstances prevailing on the two sides of the Atlantic at the time it was raised.

English political conditions at the beginning of the reign of George III were such as to afford peculiarly little promise that such a delicate relation would be handled with the requisite skill. The vicissitudes of the party system, the personal views and characteristics of the young king and the circumstances connected with his accession, all combined to make the question of the ultimate position of the sovereign in the Constitution the absorbing issue of the time. The Whigs sought a strong and permanent system of government in "the connection of agreeing politicians commanding parliamentary influence"; the Tories, "in the creation of a powerful parliamentary interest attached personally to the Sovereign, reinforced by disconnected politicians and by small groups drawn from the most various quarters and directed by a statesman who was personally pleasing to the king." Wide interpretation of the power of Parliament and Crown acting together was essential to both parties and issues requiring moderation and restraint together with firmness and steadiness in the use of this power by either party stood little chance of receiving attention on their merits. The demoralization of the Whigs and the intractable attitude of Pitt made it possible for the king and his "friends" to restore for a time the personal will of the sovereign to a position of greater power in the Constitution. But the price of this success was the utter demoralization of parties and the party system of government, which was the direct cause of the vacillation, the violent alternation between severity and indulgence toward the colonies in ministerial policy, which was itself largely responsible for the unnecessary degree of turbulent defiance of existing authority, particularly in Massachusetts.

Turning now to America, we find political conditions between 1688 and 1760, by influences outside of what was strictly the law of the situation, developing the several colonies into a group of actual commonwealths in which the forces of democratic society had far greater sway than in England and in the long run predominated over the aristocratic forces directed by the official classes. What the English government thought of as corporations emanating from the Crown but subject to ultimate Parliamentary regulation had grown into such an actual position that, whatever the technical law of the situation, it was inexpedient to treat them merely as corporations. The corporate provinces had governments almost entirely developed from native sources and the limited control over them for imperial purposes attempted by the home government met with much obstruction. The same was true, though to a less degree, of the proprietary and royal provinces, for, though the official opportunity for enforcement of control was much greater, the weakness of the support given from home to the provincial governors in their contests with the legislatures left the latter the practically dominant power in the realm of provincial development. The modeling of each provincial government on the lines of the whole English Constitution, the wide range of interest taken into cognizance by each, extending to well-nigh everything but regulation of imperial commerce, the territorial scale on which provincial interests developed, the large degree of success which the representative legislature attained in controlling this development, often in defiance or evasion of directions from home, the isolation from the rest of the colonies within which each of these developments was conducted, all contributed to a view of itself by each province as a constituent part of a federative empire.

For such a theory of empire, however, the English community on the European side of the Atlantic was very far from ready. By the letter of the law of the situation as most authoritatively interpreted at the time, colonial affairs were as much in the hands of Parliament as

any other interest of the British nation. When, then, the new circumstances of the empire created by the results of the Seven Years' War seemed to call for a policy which should (1) enforce the system of trade regulation more effectively, (2) provide for a standing military force for the control of the newly-acquired territory and (3) provide a revenue from America which should prevent the addition of the burden of expense thereby entailed to the already huge national debt, it is not surprising that, on the one hand, the ministry should take colonial obedience for granted, and on the other, that the colonists should take fright at the possibilities of oppression involved in the unlimited exercise of Parliamentary power. At all events, acts covering the above purposes were passed in 1764 and 1765. It is only fair to note that experience under the indeterminate relations previous to 1760 had been such as to lead the ministry not unnaturally to believe that unless these objects were secured by action of Parliament they would not be effectually secured at all. It is also to be observed that, whereas the power of Parliament to tax the colonies had actually been used only to regulate commerce and not to raise revenue, it is, in strict logic and in practical administration, impossible to admit the power to tax for one purpose without granting it for the other.

Of this three-fold program, distasteful in all its features to the Americans, the Stamp Act (q.v.) involved the greatest degree of novelty, invading, as it did, what imperial administration had hitherto left untouched—control of the legislature of each colony over the granting of supplies to the Crown. Upon this feature American resistance was concentrated and before the time set for the act to go into effect it had been practically nullified by the use of a variety of means, including mob violence as well as the resolutions of legislatures and of a Congress of delegates from a majority of the colonies. The basis of remonstrance was the contention that the granting of supplies from themselves for the use of the Crown by any body in which they were not personally represented was in violation of the fundamental principles of the Constitution. The English reply to this—that the colonies were virtually represented in Parliament as much as many sections and interests in England itself were—was probably quite in accord with the historic meaning of the word representation as it had progressively developed in England. But in America variations from this meaning had developed which made the theory of virtual representation in American eyes inapplicable to the case. To Americans the idea of representation adequate for taxing purposes included a franchise regulated by general rules and possessed by practically all free adult white males with a moderate amount of property and an apportionment of representatives based on territorial and popular considerations rather than on those of "interest." In all of these points the contrast with English ideas of representation was fundamental and these variations in understanding of this term help to account for the blindness of each side to the justice of the contention of the other. This theory of representation involved in matters of taxation what has already been referred to in another connection, a theory of federative empire, while the English theory was that of consolidated empire, directed by Crown and Parliament, with the colonial governments as corporations, with somewhat extended powers, to be sure, in consequence of their peculiar circumstances, but ultimately subject to complete regulation by Parliament. The attempt to enforce the revenue feature of the Grenville policy partially revealed the divergence between these two theories. The issue was raised on the specific point of revenue; on this point the colonies successfully resisted and in the repeal of the Stamp Act, in 1766, Parliament on the specific point retreated, at the same time asserting by the Declaratory Act its power over the colonies "in all cases whatsoever." Though the American resistance to the Stamp Act policy was undoubtedly a surprise to the ministry, once the incident was closed, even by such an inconclusive settlement, every effort of the government in matters of colonial policy should have been directed toward the achievement of an arrangement which should provide for development of imperial welfare without raising the issue as between Parliament and the colonies in bare and abstract terms. Instead, the ministry, now dominated by the king's personal influence, chose to raise the issue as plainly as possible by proposing a revenue scheme which technically respected the colonial distinction between external and internal taxation but in all other points carried out the essential aims of the Grenville policy. This was the real significance of the "Townshend Acts," passed in June and July 1767, and the thoroughgoing character of the American resistance to these acts was serious in a degree corresponding in ratio to the plainness with which the issue of Parliamentary legislation, in distinction from Parliamentary taxation, was thus raised. Again owing to changes in the ministry and to complaints from commercial sources the Townshend legislation was repealed in 1769, except for taxation on the single item of tea, which was retained in set terms for the saving of Parliamentary right. By this time the colonists had had experience of the consequences of the English theory of empire, under Parliament as it then was, and they now formulated their position in the phrase, "No legislation without representation." The issue between Parliament and the colonies over the fundamental question of the character of the empire—federative or consolidated—had now been stripped of most of its disguises. Upon the issue, as thus stated, king and Parliament were in essential agreement, the differences between the various groups in Parliament, and between these groups and the king, being rather concerned with the question of the most effective use of this unrestrained power. But between 1770 and 1774 irritation was developing in an increasing and dangerous degree between the imperial officials and the colonial populations. Events like the so-called "Massacre" at Boston in 1770, the destruction of the *Gaspee* in 1772 and the tea riot at Boston in 1773 led the ministry to adopt coercion of the most unqualified kind. By the acts of 1774, aimed at the punishment of Massachusetts, by the closing of the port of Boston, altering the government of the province and making new and special provision for the quartering of imperial troops, the full possibilities of the theory of the Parliamentary

consolidated empire were revealed to the colonies in general. But instead of the isolation of Massachusetts, which the ministry intended, a closer union of all the colonial governments was the result. Throughout the whole course of the agitation the impulse and the machinery of intercolonial discussion and action had been developing, and on the summons of Massachusetts a Congress of delegates from 12 colonies met at Philadelphia in September 1774. This Congress gave expression to the colonial doctrine, and provided for bringing pressure to bear on the commercial interests of Great Britain by organizing a continental scheme for non-importation of British goods. The great result of the Congress was to enlarge the scene of opposition to the ministry from Massachusetts to the colonies as a whole. In the newly-elected Parliament which met in November 1774, measures were taken still further to carry out the policy of coercion and, if possible, to divide the colonies, by providing for a general strengthening of the military force in America and forbidding the privileges of the fisheries and of trade with England to all but New York, Delaware and North Carolina. Schemes of conciliation were proposed but received only partisan consideration. Passion was now too highly involved on both sides to allow of success for any moderate or compromising plan. Any permanent scheme of governmental relations requires mutual confidence to a certain degree and this confidence had been broken down by the circumstances of the agitation of the previous 10 years. Before the news of further action by Parliament in the direction of coercion had reached America, the extra-legal organization of Massachusetts, which the opponents of ministerial policy had set up there after the alteration in the provincial government, came into armed collision with the military forces of the Crown at Lexington and the military phase of the Revolution had begun.

Armed resistance to the ministerial policy, even in the organized manner and on the serious scale with which it was carried on in 1775, probably did not appear to the majority of Americans at first to involve necessarily a separation from the empire. And yet the possibility of such an event as a last resort could not have been entirely absent from the minds of thinking men. It is in the sense of a determined and deliberate aim at such separation on the part of the average substantial citizen, that general disclaimers of the idea of separation should be interpreted. Such a project was probably in the minds of some of the leading agitators from an early stage of the controversy. But it was not until the consequences of the determined stand of the king and ministry on the issue of coercion thoroughly carried out had been manifested and the elements of passion, prejudice and interest injected still more vigorously into the situation, that independence could be made to appear desirable or necessary. The king's rejection of the "Olive-branch Petition" and the proclamation naming the Americans as rebels, in August 1776, as well as the employment of foreign mercenary troops, on the one hand, and, on the other, the appeal to local interest made by the experience of the newly-organized State governments, as well as the inability of the moderate party in America to propose any plan which promised success in achieving what was now regarded as essential, all had a powerful effect and served to obliterate the recollection and valuation of the possible advantages of connection with Great Britain under more normal circumstances. All these considerations were popularized and brought vividly to the imaginations of great numbers by Paine's pamphlet, 'Common Sense.' By May 1776, the Congress, which had acted for a year as a revolutionary general government for the United Colonies, felt justified in entering upon consideration of the subject. Increasing consciousness of the need of foreign assistance, and clearer perception of the necessity of independence as a condition of such assistance enforced the more strictly domestic reasons for the development of the sentiment of separation and on 4 July 1776 the formal Declaration was signed.

In summary, it may be said that, fundamentally, the causes of the American Revolution are to be found in the differences of characteristics progressively developed in the two English communities on the different sides of the Atlantic. These differences made the administration of the system of government by which these communities were connected a matter of difficulty under any circumstances. When a change was made in the manner and purpose of the administration of this system, an issue was raised which the English community was particularly ill-prepared to meet. The Americans practically demanded recognition of a new theory of the empire, precedents for which existed, not in the law, but in the facts of administration of the existing theory. At the beginning of the controversy the apprehensions of the Americans were more concerned with the possibilities of the existing theory for despotism than with any serious tyranny actually exercised. But the conduct of this controversy over this issue was so unskilfully managed, as it turned out, that the feelings of discontent operative in the colonies for nearly a century were stimulated to the point of resistance. Opportunity was created for what was probably hardly more than a large and aggressively active minority to carry this resistance to the point of separation from the mother-country. That a more skilful management of the controversy would have prevented the ultimate separation cannot be affirmed with confidence. The scale and character of the development of the colonial governments was making of them commonwealths not likely to be satisfied with a relation very far short of that which existed between Canada and England after 1837. And for such a relation England was hardly prepared much before that date. See COLONY.

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4. THE AMERICAN REVOLUTION (MILITARY EVENTS). The fundamental fact in the British strategy of the American campaigns was their possession of control of sea-power, for the use of which in penetration of the seaboard strip by the openings of the Hudson River and Chesapeake Bay, the topography afforded pre-eminent opportunities. In defense the Americans had the advantage of moving rapidly on lines of interior communication; and the holding of a position somewhere between the coast and the mountains from which they could keep control of these interior lines and thus prevent the success of British detachments, quite as often by refusing as by giving battle, was an essential feature of American strategy throughout the war. As a matter of fact, both sides were seriously handicapped in the course of working out their respective policies. On the American side, the prejudice against a standing army, the undue influence assumed by the States after the first flush of the enthusiasm of the Union had passed and the precarious character of the support given to military operations made the maintenance of a reliable military force a matter of supreme difficulty for the genius of Washington himself. On the other hand, after 1778, the British were involved in war with France, after 1779 with Spain, and after 1780 with Holland and in this quadruple contest found no allies.

The first three years of the war constitute, in a way, the most critical period from the strategic point of view, for it was in these years that the British held undisputed possession of all the military advantage which control of the sea could give, and it was in this period that their most serious attempt to break the confederacy in two by occupation of the Hudson-Champlain-Saint Lawrence waterway was made and frustrated. In 1775 the Americans succeeded in keeping the British force confined in Boston while the attempt at the capture of Quebec by a double expedition north from Ticonderoga and northwest and west through the Maine forest under Montgomery and Arnold was made. This invasion collapsed and the evacuation of Boston by the British in March 1776 left each side in possession of its own territory.

The campaign of 1776 saw the British attempt at occupation of a Southern port, Charleston, repulsed and the advance south from Canada checked by Arnold's impromptu naval force on Lake Champlain till so late in the season that it got no further than Crown Point. New York, however, was occupied by the British army, supported by the fleet, and Washington's army was forced across New Jersey, leaving the mouth of the Hudson and large parts of both East and West Jersey in the hands of the enemy — supposedly for the winter. But Washington's masterly surprise at Trenton and manœuvre at Princeton in the last days of 1776 enabled him to hold northern New Jersey and keep the British confined to New York City and East Jersey only as far as Amboy and New Brunswick. The campaign of 1777 should have been devoted by the British to the single great object of occupying the whole length of the Hudson-Champlain-Saint Lawrence waterway, both ends of which lay in their possession. This fact made it the most available opening for their purpose and once the connection between the termini was made, the task of reducing the confederacy by sections would become practicable. But Howe's move on Philadelphia by sea so reduced the strength and delayed the co-operation of the force at the mouth of the Hudson with the southward movement of Burgoyne that the latter, hindered in his movements and unable to maintain himself at so slow a rate of advance, was surrounded and captured before the former had covered half the distance between New York and Albany. It is impossible to overestimate the importance of this achievement of the Americans. It made possible the French Alliance, which not only increased the military resources of the American defense by the use of the French sea-power, but involved the dispersion of the total military resources of the British against several opponents instead of allowing them to concentrate on the task of subduing the Americans. The consequences became apparent in the campaign of 1778 which was opened by Clinton's withdrawal from Philadelphia across New Jersey toward New York, close-pressed at Monmouth by Washington, who now took up a position north and west of New York, from which he could watch and attack any movement of the enemy toward either New England or Philadelphia. This position these armies practically maintained without decisive engagement till the end of the war. There was an attempt of the French fleet and American land force against Newport in 1778 which ended in failure. There were numerous marauding expeditions by the British, designed to draw Washington from his commanding position. There was on the other hand the capture of the posts in the country west of the Alleghanies in 1778 and 1779 by Clarke, which had important consequences for the future development of the country. But from 1778 on, the most active endeavors of the British invading force were directed against the Southern States. The bold dash of Wayne on Stony Point in 1779 and the narrow escape from loss of the Highlands of the Hudson through Arnold's treason in 1780 were only episodes in a situation in the North which showed no decisive changes from 1778 to 1781.

The British attack on the South was renewed in 1778 by the capture of Savannah and the reduction of the greater part of Georgia. The British seem to have counted on the large number of slaves in the Southern States as an element of weakness in the defensive capacities of the region and to have planned to roll up

the South from Georgia to Virginia by combining use of sea-power with the threat at the altars and fires of the interior by an overrunning force. An attempt in the summer of 1779 at a recapture of Savannah by the combination of the French fleet and American and French land force under Lincoln was repulsed. The capture of Charleston in 1780 by the British fleet and army made the soil of the Carolinas for the two following campaigns the scene of an interesting conflict between two efficient armies, each under competent leadership, and, at first, on something like even terms, as far as aid from local partisans is concerned. The crushing defeat of Gates by Cornwallis in August 1780, at Camden, S. C., seemed to promise Cornwallis the control of the whole State and a threatening position toward North Carolina, but the American victory at King's Mountain in October 1780 served to keep him close to territory controlled from the sea. Greene now succeeded Gates in command of the American army and after King's Mountain and the battle of the Cowpens had largely deprived Cornwallis of his light troops, succeeded in drawing him away from the coast and northeastward across North Carolina almost to the Virginia line. Here, at Guilford Court House, in March 1781, in an action which was tactically a defeat for the Americans, Cornwallis was so weakened that more thorough invasion of the Carolinas became impossible. He retired first to Wilmington on the coast and then, as it became evident that Greene was returning southwestward again, crowding the British back to the coast at Charleston and Savannah, himself turned away and joined Arnold in Virginia in May.

The French Alliance now supplied, for the first time in an effectual manner, that indispensable element in the American defense, lack of which had prevented development of its more aggressive possibilities — viz., control of access by the sea. The threat upon New York by the French fleet and the forward movement by the American force drew off strength from Cornwallis in Virginia and kept Clinton close in New York till the strength of Washington's and Rochambeau's force was far on its way to Virginia. In the meantime, De Grasse's seizure of the entrance to Chesapeake Bay and the five days' action with the relieving British fleet off the entrance isolated Cornwallis, now intrenched on the peninsula between the York and the James rivers, for a long enough period to allow of the complete investment of his posi- French fleet in his rear. Having exhausted the resources of such a position before the English fleet could appear again, Cornwallis surrendered 19 Oct. 1781. It is worthy of note tion by superior numbers in front and the that this was the first failure of the British seapower on the coast during the war and the thoroughness with which this first opportunity was exploited for purposes of aggressive defense indicates the grasp of the situation as a whole and the cautious daring which characterized Washington's strategy. The British were now in possession only of the ports of New York, Charleston and Savannah, and by reason of the moral effect of the capture of Cornwallis the war was practically at an end.

The decisive battles may be selected as follows: Bunker Hill, 17 June 1776, which inspired the British commanders with a firm notion of the inexpediency of a front attack on American forces behind breastworks; Long Island, 27 Aug. 1776, which gave the British the control of the mouth of the Hudson; Saratoga, 17 Oct. 1777, which frustrated the attempt to break the confederacy in two and which brought the French Alliance; King's Mountain, October 1780, and the Cowpens, 17 Jan. 1781, which deprived Cornwallis of his light troops in his overrunning of the Carolinas, and the naval action at the entrance of Chesapeake Bay, in the early part of September 1781, which made the siege of Yorktown possible.

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5. THE DECLARATION OF INDEPENDENCE. On 10 June 1776 the Continental Congress appointed a committee to draft a Declaration of Independence. (See DECLARATION OF INDEPENDENCE). Jefferson, the most radical theorist on this committee, wrote out a rough draft of the Declaration. This was carefully revised by the committee and reported to Congress on 28 June. After further revision by that body it was adopted on 4 July and after being engrossed was signed on 2 Aug. 1776 by the members of Congress then present. The contents of the document fell under four heads: (1) the preamble, (2) theories of government, (3) an enumeration of a "long train of abuses" and (4) the resolution declaring independence. Of these the second and third portions are the most important. The philosophical doctrines underlying the Declaration as well as the phraseology in which they were given expression were not new. The document was simply the embodiment of ideas which had been prevalent for many centuries and which had crystallized into the systems of political philosophy of the 16th, 17th and 18th centuries. Jefferson had borrowed the ideas and even the language of Locke. The latter had found predecessors in Hobbes and Hooker. Hooker, a churchman, was simply giving expression to ideas which had been prevalent among Church writers during the religious wars in France, the struggles concerning the powers of Church councils in the 15th century, the strife between Louis of Bavaria and the popes of the 14th century and the investiture controversy of the Hildebrandine epoch in the 11th century. For the introduction of the ideas to churchmen probably no one was more responsible than Saint Augustine (354–430 A.D.).

The five fundamental theories of the Declaration are: (1) The doctrine of equality — "all men are created equal"; (2) the doctrine of

inalienable rights; (3) that the origin of government was in a conscious act or compact—"governments are instituted"; (4) that powers of government rest on the consent of the governed; (5) the right to throw off government, that is, the right of revolution or resistance. The compact theory of the origin of government is first found in the theories of Protagoras and the Sophists (481–411 B.C.). The Stoics at the time of Zeno (308 B.C.) brought forward the doctrine of the common brotherhood and equality of men. Cicero (106–43 B.C.) gave expression to the theory that all men in a state of nature have certain equal rights. The Roman jurists of the empire declared that though the will of the prince had the force of law, it had such only because the prince's power was conferred on him by the people. This idea was expressed more definitely by Saint Augustine when he said that government rested on a general pact of human society to obey kings—in other words, that government rested on the consent of the governed. The theory of resistance to the mandates of a ruler was given expression to by Socrates (469–399 B.C.) and the Apostle Peter, but Saint Augustine was the first to give unqualified approval of it in a general statement. He said that it was not always bad not to obey a law, for when the ruler makes one which is contrary to God, hence to divine and natural law, then it is not to be obeyed. Augustine thus contributed the idea of resistance to a law contrary to natural rights, while the jurists had merely stated that laws should not be contrary to natural rights. They had not advocated resistance.

The five fundamental philosophical theories of the Declaration were, therefore, in existence by the time of Saint Augustine. They were used separately or together throughout the Middle Ages. The struggles between the temporal and spiritual powers of the time—the empire and the papacy—gave excellent opportunities for their use. This is especially true of the fight which broke out between Henry IV of Germany and Pope Gregory VII (1073–85). If the popes could get a general acceptance of the above theories, the power and pretensions of the temporal rulers would be thoroughly undermined. It was natural, therefore, that in the works of those Church writers who supported the popes frequent expression should be given to just such doctrines as those which later found place in the Declaration of Independence. The theories of Manegold von Lautenbach (1081), a participant in the above struggle on the side of the Pope, will serve as an example. He declared that the state was the mere work of man. Kingship does not exist by nature or by merit. Even the word king is a mere word of office. The power which he has was given him by the people. They did not exalt him above themselves so as to concede to him the free faculty of exercising tyranny, but they exalted him so that he should defend them from tyranny and interference by others. The people established government for mutual protection. They made a compact with the king and chose him king that he might force evil men to obedience and defend the good from the bad. If he falls into tyranny himself, the people are freed from his dominion and from subjection to him. As you would dismiss a swineherd for not taking care of his herd, so must you with better and more just reason remove a king. Similar expressions of some or all of the doctrines are to be found in Gratian's codification of the canon law, in the writings of Peter Lombard, Alexander of Hales, Saint Bonaventura, Saint Thomas Aquinas, Englebert von Volkersdorf, Marsiglio of Padua, William of Occam, Wiclif and others. Nikolaus Cusa (1401–64) may be said to have been the first writer who combined the various theories into a systematic whole. "Since all men," he says, "are by nature free, then government rests on the consent of the governed"; and so he proceeds, deriving one doctrine from another. The connection of Cusa and the men before him with Hooker, Hobbes, Locke and Jefferson is to be found in the writings of such authors as Languet and others who wrote during the Wars of Religion in France: Undoubtedly all of these writers, including even the makers of the Declaration, firmly believed in the doctrines to which they gave expression. The fact that they used their theories for political or partisan purposes does not warrant the opinion that they did not believe in them. The doctrines no doubt had their origin in man's ideals of what should be and in that sense are purely philosophical in their character. The attempt to give them a historical foundation proved successful so long as scientific historical and legal studies were in a backward state, but during the course of the 19th century the historical foundation for the doctrines received scant consideration from the hands of publicists and students of history. Notwithstanding the unhistorical character of the principles of government embodied in the second portion of the Declaration, their influence has been enormous, and the world at large clings to them as if they had a historical origin in a primitive state of nature.

The third portion of the Declaration like the first is based on precedents. The enumeration of the "long train of abuses" is similar to the Grand Remonstrance of Parliament in the reign of Charles I. The list of abuses really forms a history of the relations between the English king and the colonies during the second and third quarters of the 18th century. The actions of the king are held to be in violation of rights which Englishmen had embodied in such documents as the Magna Charta, the Petition of Right, the Bill of Rights and the Act of Settlement. As Englishmen the colonists regarded themselves as entitled to the rights of Englishmen. They did not share the belief prevalent in England that the inhabitants of colonies were to be treated somewhat differently from Englishmen who stayed at home. Their ancestors had left England when English ideas of representation in Parliament were undergoing a change during the control of Long Parliament and Cromwell. In the new land of America they developed theories and customs of representation essentially different from those restored by Charles II. Englishmen at home might feel that they were represented by Parliament whether they voted for any one of its members or not, but in the colonies the idea had grown that a representative in a legislative body only represented the men who had a voice in his selection and who lived in the territorial district from which he was chosen. So to the colonists "the imposing of taxes without our consent"

meant one thing, while to Englishmen it meant another. The other grievances enumerated, such as the deprival of the benefits of trial by jury and the quartering of armed troops among the colonists, undoubtedly played an important part in bringing about the War of the American Revolution, but probably no one thing contributed so much to the opening of that war as the feeling expressed in the phrase "the imposing of taxes without our consent."

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6. THE AMERICAN REVOLUTION (DIPLOMATIC CONDITIONS DURING THE WAR AND THE PEACE NEGOTIATIONS). Attempts to enter into relations in some form with foreign powers are to be found in the very early stages of the existence of the United States. In November 1775 Congress appointed a committee to correspond with friends in other parts of the world and this committee very soon came into communication with agents of the French government, sent to observe conditions in the colonies. Early in 1776 this committee appointed Silas Deane as their agent to go to France for the purpose of obtaining military supplies and by the last of July he had been admitted to an interview with Vergennes, the Minister for Foreign Affairs, and had been put into connection with Beaumarchais, through whom, with the connivance of the government, important supplies of war were furnished. Deane had been instructed to inform Vergennes that France had been selected as the first power to whom this application should be made "from an opinion that if we should . . . come to a total separation from Great Britain, France would be looked upon as the power whose friendship it would be fittest for us to cultivate." After the Declaration of Independence, France and Spain, as powers most unfriendly to England, were still courted with the greatest diligence, but ministers or plenipotentiaries were also commissioned from time to time to the other courts on the Continent. From none but France and Holland, however, was recognition obtained, and from only these two was any official aid or countenance given before the conclusion of peace. Holland's recognition was extended just before the completion of the peace negotiations and Spain, though refusing to recognize the United States in the early days of the struggle, afforded a limited amount of financial assistance. In many regions of Europe among the people and at several of the courts, there was a disposition friendly to the American cause, but in no case was this disposition serious enough for practical purposes to lead the governments away from the path of strict neutrality, except in the limited way afforded by the Armed Neutrality.

From the first, the French government had taken great interest in the colonial revolt and, before the arrival of Deane, had determined for the present to remain nominally at peace with England, but to assist the revolt surreptitiously with just enough energy to keep both sides actively and, if possible, exhaustingly, occupied. In this policy the Spanish government joined and between the two governments 2,000,000 livres were placed at the disposal of the insurgents in the summer of 1776. In September 1776 Congress adopted a general plan for treaties to be proposed to foreign powers and joined Franklin and Arthur Lee with Deane as commissioners to lay such a treaty before the French government. The coming of Franklin increased the general popularity of the American cause, but the government was not disposed to change its attitude for the relations of the proposed treaty, which was concerned largely with commercial relations and provided for no political alliance. Apparently Congress' appreciation of the need for foreign aid grew stronger after the British capture of the mouth of the Hudson and shortly after the meeting of the commissioners in Paris they were instructed to abandon the commercial basis of the proposed treaty and to propose to France and Spain a political connection, offering assistance to France in conquest of the West Indies, and to Spain in the subjugation of Portugal. Little substantial progress was made, however, in this direction till December 1777, when news was received of the surrender of Burgoyne's army at Saratoga. This signal achievement of the Americans entirely changed the face of affairs by convincing France of the probability of ultimate American success, and within a few days of the receipt of the news the commissioners were informed, in reply to their peremptory inquiry as to the intentions of the government, that the king was determined to acknowledge the independence of the United States and to enter into treaty relations in support of that independence. Accordingly, on 6 Feb. 1778, two treaties, one of commerce, on the most-favored-nation principle, and one of alliance, which provided for an intimate political association of the two countries, were signed. The treaty of alliance, which was very different from the original American proposals, stated the object of the alliance to be the maintenance of the sovereignty and independence of the United States in government as well as in commerce, provided for mutual aid in case of war between France and Great Britain, agreeing that territory reduced by the United States in the northern part of North America and in the Bermudas should belong to the United States, and that conquests in the West Indies should belong to the king of France, stipulated especially that neither party should conclude peace with Great Britain without the formal consent of the other first obtained, and provided for the continuance of the war with Great Britain till formal or tacit recognition of the independence of the United States by the treaties ending the war. Articles XI and XII provided for a mutual and perpetual guarantee of possessions in the western hemisphere, which was to give serious trouble in the subsequent relations between the two states. Whatever the sentiments of the French people, the French government entered into this relation, as was

plainly stated in the announcement to the commissioners of the king's determination to recognize the new state, from no purely disinterested motives in favor of the Americans, but on the ground that it was manifestly to the interest of France that the power of England be diminished by the separation of the colonies. The popular sentiment for the American cause simply co-operated with Vergennes' aggressive designs on England in opposition to the more prudent suggestions within the government as to the ruinous effect of such an expensive enterprise upon French finances.

Since the Family Compact between the Bourbon kingdoms in 1761, the relations of France and Spain in all matters of external policy had been of the closest alliance, and the French-American treaty of 1778 contained a clause providing for the accession of the king of Spain to its terms. Nevertheless Spain found the general spirit and the precise terms of this alliance not at all to her liking and announced to England that she held herself free from any such engagement, and proceeded to offer mediation on terms which would leave England in possession of the Saint Lawrence Valley and the territory northwest of the Ohio, and herself in possession of everything west of the Alleghanies and south of the Ohio. On the refusal of the British government to accede to such mediation, Spain at length, on 12 April 1779, allowed herself to be urged into war with France against Great Britain, but expressly refrained therein from alliance with, or recognition of, American independence. In the meantime, Luzerne, the French Minister to the United States, was trying to persuade Congress that Spain's price for an alliance with the United States, namely, the Floridas and exclusive navigation of the Mississippi, was not too high, and that the accession of Spain to the alliance would be likely to bring about peace speedily. In September of the same year, Jay was sent as United States Minister to Spain with instructions to the purport that if Spain would accede to the treaties with France she should not be precluded from receiving the Floridas, and that if she should wrest them from Great Britain, the United States would guarantee them to her, provided that the United States should enjoy the free navigation of the Mississippi, and this proviso was laid down as an ultimatum. Jay was further instructed to secure a port on the Mississippi below the 31st parallel. Jay's mission was entirely unsuccessful, even after the change of his instructions, which abated the American claim to navigation of the Mississippi as an ultimatum.

In the meantime, in preparation for any opening that might develop, Congress had been preparing instructions for a commissioner to participate in negotiations for a general peace. In addition to recognition of independence, boundaries, substantially such as actually were finally adopted, the Newfoundland fisheries, free navigation of the Mississippi, with a port below the 31st parallel were laid down, at first, as ultimata, with John Adams, appointed as sole commissioner. But in 1781, under the influence of Luzerne, these instructions were revised, by referring to the claims therein indicated as expressing the desires and expectations of Congress, but by leaving the commissioners at liberty to secure the interests of the United States as circumstances might direct and enjoining them to undertake no negotiations for peace without the knowledge and concurrence of the French ministers and ultimately to be governed by their advice and opinion. Franklin, Jay, Laurens and Jefferson were joined with Adams as commissioners.

The news of Cornwallis' surrender had so strengthened the hands of the opposition in England that in March 1782 North resigned, and the recognition of American independence was made a condition of acceptance of office by Rockingham. In proceeding to negotiations, considerable difficulty was experienced over the matter of the relation between the recognition of independence and negotiation of other topics. For reasons of his own, Vergennes encouraged the American commissioners in holding out for unconditional acknowledgment as a prior condition to negotiation. In the meantime Jay and Adams became convinced that Vergennes would, for the sake of Spain, as well as in conformity with his own plans for America, oppose the American claims in the matter of the western boundaries and of the fisheries. In conscious disregard of their instructions, they independently suggested to Shelburne an arrangement which fully recognized independence before negotiation and at the same time allowed him to see that a majority of commissioners present in Paris were willing to proceed in negotiations with Great Britain separately from their ally. Shelburne immediately took advantage of the division of the allies and with Franklin's reluctant consent, preliminary articles, exactly coincident with the treaty signed in connection with the treaties of the other belligerents, were signed 30 Nov. 1782. The arrangement was then revealed to Vergennes, who, at first, indignant at the apparent bad faith, was pacified by Franklin's soothing explanations. As a matter of fact, both Frenchmen and Americans had scrupulously fulfilled the letter of their agreement in everything which had been exactly stipulated and in other matters, each nation equally had acted in accordance with its own views of interest.

The definitive treaty, signed in connection with the treaties between Great Britain and the other belligerents 3 Sept. 1783, recognized in its first article the independence of the several 13 States. The boundaries of the new nation were, on the west, the Mississippi River south to the 31st parallel; on the south, the 31st parallel from the Mississippi to the Chattahoochee, down that river to its junction with the Flint, thence in a straight line to the source of the Saint Mary's and thence to the sea; on the north, practically the line of the Lakes and the Saint Lawrence, leaving stretches at the northeast and northwest corners so indefinitely described that much trouble was experienced at these points in later times. Both countries were to have free navigation of the Mississippi. The United States was to enjoy the right of fishing at all places where the inhabitants of both countries used at any time heretofore to fish, and the liberty of drying and curing fish on lands, except Newfoundland, which were unsettled. Creditors on either side were to receive no impediment to the recovery of the full value of debts heretofore contracted. Congress was earnestly to recommend to the States to pass acts in relief of the Loyal-

ists. Provision was made for bringing hostilities to a close. By a separate and secret article it was provided that if Great Britain should win back the Floridas from Spain, the southern boundary of the United States between the Mississippi and the Chattahoochee should be the parallel of 32° and 30′. The conclusion of this peace has been generally regarded as a remarkable achievement on the part of the American commissioners and its successful outcome is to be attributed not only to the daring statesmanship which disregarded the instructions of Congress, but also to the influence of Franklin in France, and the skill with which appeal was made to the enlightened generosity of the sentiments of the ministry in power in Great Britain.

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7. ARTICLES OF CONFEDERATION. On 10 June 1776 the Continental Congress appointed a committee to frame an instrument of government. This was entitled the «Articles of Confederation and Perpetual Union.» (See CONFEDERATION, ARTICLES OF). It was not until five years later (1 March 1781) that all of the States had finally signed it. The defects of this scheme of government were so numerous and serious that for a time it looked as if the Union would go to pieces. Under such circumstances attempts were made at various times to change the Articles in such a manner as to give more power to the central government in those matters in which it was most seriously hampered: the finances, commerce and power to coerce the States. The first proposal to amend the Articles was made on 1 Feb. 1781, even before they went into effect. This was known as the Five Per Cent Amendment. Its avowed purpose was to give to Congress the power to levy a 5 per cent ad valorem tax on most articles imported and on all prizes taken on the high seas during the war. The proceeds of this tax were to go toward paying the principal and interest of the debt contracted during the war. Within a year 12 of the States had consented to the passage of this amendment, but Rhode Island refused. As the approval of *all* States was necessary for an amendment, this naturally failed. On 16 March 1781 Madison submitted a report of a committee which recommended giving to Congress the power to coerce the States to fulfil their Federal engagements. This power was to be embodied in an additional article to the Articles of Confederation. This report was referred to a grand committee on 2 May 1781 and reported back by it on 20 July of the same year. On its recommendation a new special committee of three was constituted to prepare an exposition of the Confederation, a plan for «its complete execution and supplemental articles.» This committee reported on 22 August and thought it ought to be discharged from the exposition of the Confederation because such a comment would be voluminous if coextensive with the subject. The committee, nevertheless, made a report on the defects of the Articles of Confederation, and made strong recommendations that many supplemental powers be given to Congress. The committee further advocated that a committee be appointed to prepare representations to the several States of the necessity of these supplemental powers and of pursuing, in the modification of the Articles, one uniform plan. These recommendations, however, came to naught. The matter of the defects of the Articles was taken up from the outside and on 26 Feb. 1783 Pelatiah Webster issued 'A Dissertation on the Political Union and Constitution of the Thirteen United States,' in which he advocated the adoption of very thoroughgoing changes in the Articles. He proposed to divide Congress into two bodies and to give it greater power over the States and over individuals. On 18 April 1783 a Revenue Amendment was introduced into Congress. The object of this was to obtain for Congress the power to levy specific duties on certain articles imported and a 5 per cent ad valorem duty on all other goods at the time and place of importation. The collectors of the duties were to be appointed by the various States and after appointment were to be amenable to and removable by Congress. The proceeds from the duties were to be applied to the payment of the principal and interest of the debt. Under the same amendment the States were to make provision, during a term not longer than 25 years, for the collection and payment of their proportion of the Federal expenses. In the same connection it was suggested that the basis for the calculation of such proportions be changed from the value of land in each State, as was prescribed in the eighth article of the Articles of Confederation, to the number of people in each State. Again 12 States approved of this amendment, but this time New York, having just worked out an elaborate scheme of duties for herself against the other States, refused to ratify it. Alexander Hamilton of New York drew up an elaborate exposition of the defects of the Articles and on 3 June 1783 intended to present it to Congress along with a resolution calling for a general convention to revise the Articles, but he abandoned his project for want of support. On 30 April 1784 another amendment was recommended by Congress. This time Congress asked to have given to it for a period of 15 years the power of forbidding trade with foreign powers having no treaty of commerce with the United States and of prohibiting the citizens of any foreign state from importing into the United States any articles which were not the produce or manufacture of that State. This proposal, so essential in its essence for the government of every country to have in that age of restricted trade, was ratified by only two States and, therefore, failed of adoption. In 1785 another man outside the halls of Congress, Noah Webster, put forth, in his work entitled 'Sketches of American Policy,' suggestions for the improvement of the Articles. Like many

other men of the time he recommended a strong executive and giving to Congress the power to coerce the States. About the same time James Monroe introduced in Congress a proposition to change article nine of the Articles in such a way as to give Congress the power to place retaliatory duties on the products of foreign states that discriminated against the United States. The proceeds of such duties, however, were not to go to the Federal government, but were to go to the State in which they were collected. This proposition was referred on 28 March 1785 to a committee of which Monroe was chairman and on 13 and 14 July of the same year was discussed in Congress, but no action was taken. A similar proposition to that of Monroe's was embodied in the report on trade and revenue presented to Congress by a grand committee on 14 Aug. 1786. Additional proposals in the same report recommended that the States which delayed to pay their proportions of the funds required for the running expenses of the Federal government should have to pay fines in addition, that in States which made no provision for collecting the sums asked for Congress should have power to step in and order them collected by State officers and in case of necessity appoint officers or agents of its own to collect them, and that States offering resistance to Congress or its agents in making such collections should be considered as violating the Federal compact. Further provisions in this committee report gave Congress the power to introduce new systems of revenue and to make regulations for the finances, and if 11 of the States agreed to such systems or regulations, they were to become binding on all. In addition Congress was to be given the power to institute a court of seven members to try officials of the Federal government and to hear appeals from the State courts concerning the interpretation of treaties or regulations made by the Federal government. On the report of this grand committee Congress took no action. The longer the Confederation existed the more hopeless the chance for a strong central government became. From all sides came expressions of fear and alarm for the Union itself. As early as 1783 Washington, in a circular letter to the State governors, had expressed fear for the Union and declared that there must somewhere be lodged a supreme power to regulate and govern the general concern of the Confederated Republic, or it would go to pieces. Jay, in a letter to Washington in 1786, said: "I am uneasy and apprehensive, more so than during the war." From our former friends in Europe came the disquieting news that they no longer had confidence in our credit. Adams in trying to negotiate a loan in Holland in 1784 was met with expressions of distrust in the stability of the Union—a distrust which the London gazettes did everything to encourage. As Congress had failed utterly in all attempts it had made to have the Articles amended, help had to come, if it came at all, from some other quarter. Congress had lost the respect of the country through no fault of its own. The most capable men had deserted its halls for those of the State legislatures. Everything seemed to point to a speedy dissolution of the Union as it existed under the Articles of Confederation, when aid came from an unexpected quarter and quite by accident. This was the Alexandria Convention, called to settle commercial disputes between Virginia and Maryland. From this grew the Constitutional Convention. The new Constitution (q.v.) drafted by that body was ratified by nine States and 4 March 1789 set for its inauguration. On 2 March 1789 the Congress of the Confederation adjourned *sine die,* and thus brought the government under the Articles of Confederation to an end.

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8. THE FORMATION OF STATE CONSTITUTIONS. When the resistance to Great Britain first began, independence was not the aim and in consequence only provisional governments were established, temporarily to take the place of the English colonial governments which had one by one succumbed or been suppressed. Provisional Congresses or Conventions in the several colonies assumed political control, entrusting the executive function to Committees of Correspondence and of Public Safety. Under these loose revolutionary organizations government was conducted for several months, but as it soon became evident that the contest was to be a prolonged one, there gradually arose a conviction that more regular and permanent forms of government should be ordained. The several colonies turned to the Continental Congress, representing all the colonies, for direction, and this body took the initiative in inaugurating the several State governments. Quite naturally, the first request came from the Provincial Congress of Massachusetts, as in that colony hostilities already had broken out. On 16 May 1775 that body asked its "explicit advice respecting the taking up and exercising the powers of civil government." The Congress replied 9 June, recommending that they should call upon the several towns entitled to representation in the assembly to elect members, and the assembly so chosen should elect a council, the two bodies should govern in approximate conformity to the spirit and substance of the colonial charter, until a governor of his majesty's appointment should consent to govern according to that instrument. This advice was promptly followed and the government so organized remained in force until 1780, when the first constitution of that State was established. A few months later New Hampshire, South Carolina and Virginia successively sought guidance with respect to the establishment of their civil governments, and by November Congress advised them respectively "to call a full and free representation of the people" that they may adopt "such a form of government as in their judgment would best promote the happiness of the people and most effectively secure peace and good order in the province during the continuance of the dispute with Great Britain." Finally as the movement in favor of independence gained adherents, Congress 10 May, in anticipation of the Declaration of Independence, recommended that the colonies that had not already done so

should establish regularly ordained governments. In consequence of this advice, the colonies, each soon claiming to be of right a free, sovereign and independent State, were shortly inaugurating their first State constitutions.

New Hampshire's constitution was completed 5 Jan. 1776, to be followed by South Carolina on 26 March. Both of these constitutions were incomplete and unsatisfactory, and proved but temporary, as they were replaced by new ones within a few years. Rhode Island and Connecticut retained their colonial charters. The former simply discharged its people from their allegiance to the king by act of the legislature of 4 May, the latter provisionally effected a similar change 14 June, which it made permanent by act of 10 October, at the same time enacting a short bill of rights. Virginia adopted its constitution 29 June, and New Jersey's was proclaimed on 3 July. Thus before the Declaration of Independence seven States had assumed independent governments, and four had drawn up written constitutions. Four other States followed in the same year, Delaware, 21 September; Pennsylvania, 28 September; Maryland, 11 November and North Carolina, 18 December. In the year 1777 Georgia adopted a constitution on 5 February, and New York did likewise on 20 April. South Carolina's second constitution was promulgated 19 March 1778. Massachusetts continued under its provisional government until 16 June 1780, when its constitution went into force. New Hampshire finally secured a new frame of government, 2 June 1784. Vermont, although unrecognized by the other States, pursued her own independent course, framing two constitutions during this period, those of 1777 and 1786. The first was largely copied from that of Pennsylvania. No other State constitutions were adopted prior to the ratification of the Federal Constitution.

The compact theory, especially as put forth by John Locke in justification of the English Revolution of 1688, was generally accepted in America by the constitution makers of the Revolutionary period. Its principles as explicitly set forth not only in the Declaration of Independence, but in all the State constitutions as well, were that the people have the natural right to abolish or alter their form of government when in their judgment it has become destructive of their rights. Seven of the constitutions expressly declare that their former relations are dissolved because the king had violated the compact. This served as the basis for the legal defense of their action. Sovereignty, it was commonly held, rested in the people, and from them alone emanated the power to inaugurate a new form of government. But in practice they departed somewhat from this theory. Although in most of the States the people were consulted through their choice of representatives to a provincial convention, which should draft a frame of government, there were several exceptions, as in the case of both the constitutions of South Carolina. Neither was the Virginia Provincial Convention, nor the New Jersey Congress specifically empowered to frame a constitution, but each assumed that they were authorized to act in accordance with the advice of Congress. Again in the framing of the early Revolutionary constitutions that careful distinction that came later to be made between a legislative body and a constitutional convention was not observed. Owing to the exigency of the times, the Provincial Congress or Convention in each of the States that framed constitutions during the years 1776 and 1777, with one exception, acted not only in the capacity of a constitutional convention, but also assumed the powers of legislation and administration. The one exception was in the State of Delaware, where a convention not only was chosen for the express purpose of framing a constitution, but dissolved upon the completion of that work. None of these constitutions was submitted to the voters for their approval, but went into operation at once upon their adoption by the convention. The first State to inaugurate the practice of seeking the sanction of the people upon the work of the framers was Massachusetts in 1778, but the proposed constitution was rejected by the voters. Two years later a constitution which had been drawn by a convention elected for the sole and express purpose of framing a fundamental law, was adopted by the people of Massachusetts. This practice was followed by New Hampshire in the inauguration of its second constitution in 1784.

The State constitutions reveal the continuity in the development of American political institutions. They have been called by Bryce "the oldest things in the political history of America, for they are the continuations and representations of the colonial charters." It is in the colonial charters, especially in the corporate colonies, that we find their prototype. These documents served as the written constitutions of the respective colonies, according to which they were governed. So liberal were those granted to Connecticut and Rhode Island that they served these States respectively until well into the 19th century. But in addition to the charters there were other elements that entered into the State constitutions. The colonists had a century and a half of experience to draw upon, during which their governments had undergone great development and many new features both written and unwritten had been added to their fundamental law. Moreover, at the basis of all their legal ideas was the English constitution and the common law, both of which profoundly and perhaps unconsciously influenced them. They also accepted the prevailing political philosophy of the age, as above indicated—which was derived chiefly from English sources, although no one writer exerted a greater influence upon them than Montesquieu (q.v.) through his 'Spirit of Laws.' Speaking generally "the first State constitutions were little more than the pre-existing colonial constitutions adapted to the changed circumstances."

The main features of the constitution consisted of the Bill of Rights (q.v.),—in some introduced by a preamble,—and the constitution proper. Eight of the instruments of this period, if we include Vermont, were prefaced by bills or declarations of rights, and in the other constitutions there were important provisions of this character. The first of these was adopted by Virginia, and was drafted by George Mason. To a considerable extent it served as a model for the other States. In all the bills of rights there were some 100 different provisions. They were a statement of what Americans regarded as the inherent rights of man. While doubtless suggested by the English Bill

of Rights, they were much more comprehensive and explicit than their English prototype, and deal much more with the rights of the individual. Thus typical provisions are the declaration that "all men are born free and equal," and are to be protected in their personal and property rights. Freedom of religion, freedom of speech, the right to bear arms and of trial by jury are all carefully guarded. Similarly the freedom of the press, freedom of election, the right of assembly and of petition are guaranteed. Excessive bail and fines, cruel and unusual punishments, unwarranted search and seizures, the quartering of troops in times of peace are all prohibited. The granting of titles of nobility, hereditary honors or exclusive privileges are forbidden. All of these are principles that have been accepted as essential to the perpetuity of a democratic republic.

All the constitutions recognized the principle of the threefold separation of powers, and provided for the establishment of distinct legislative, executive and judicial departments. Not only had the experience of the Colonial period tended toward the differentiation of these three departments, but its importance had been emphasized by Montesquieu. Some of these instruments explicitly declared, as that of Massachusetts, that no one of the departments should ever exercise any of the powers of the other two, but in practice this principle was frequently not observed. In the organization of the legislative department all the States except two made provision for the bicameral system which had been developed during the colonial times. Pennsylvania and Georgia were the exceptions. They retained their single house. The lower branch was the more popular and numerous, the senate, as the upper house was most frequently styled, being not more than one-third or one-fourth its size. Representatives were variously apportioned, not in general according to the population, but the local divisions of the town in New England and of the county elsewhere served as the basis of representation. Old inequalities were continued and in some instances new ones were introduced. For the senate the same unit of representation served as for the house in four States, but special senatorial districts were created in others. The members of the lower house were elected annually except in South Carolina, where the term was two years. In the majority of the States the term for the upper branch was also one year, but in four it varied from three to five years. In all of the States save three the members of both houses were elected directly by the qualified voters, but by the first constitutions of New Hampshire and South Carolina the members of the upper house were chosen by the lower out of their number and in Maryland there was a senatorial electoral college. A freehold or property qualification was required in all the States for membership in either branch, and also for the executive, except in Pennsylvania, where the payment of a poll tax was sufficient. In addition to a higher age and residence requirement for senators, a larger property qualification was usually called for, as the senate was supposed to represent property. Thus in New Hampshire a senator must possess a freehold of £200, the governor £500; in South Carolina £2,000 and £10,000 for the respective offices. In addition religious qualifications were required by all the States for governor and members of the legislature, except New York and Virginia. The usual one was that the member must be a Protestant, in two a Christian, but in four a believer in the inspiration of the Scriptures, and in Delaware of the doctrine of the Trinity as well. In the organization of the executive department all the constitutions, except two, made provision for a single executive, who was usually called the governor. By the first constitution of New Hampshire there was no provision for a distinct executive. In Pennsylvania an executive board was established. In only three States was the executive elected by the people, in the others he was chosen by the legislature. His term of office was usually one year, but in two Middle States it was three years and in South Carolina two. In nearly all the States an executive council, elected by the legislature, was associated with the governor. This body inherited the advisory and administrative functions of the old colonial council. It was to act as a check upon the governor, sharing with him the exercise of those few powers that had not been already vested in the legislature.

A comparison of the powers conferred upon the legislative and the executive departments reveals the fact that the constitution makers were very much influenced by their colonial experience. They were mindful of the recent contests between the royal and proprietary governors and the legislatures. This led them to fear executive usurpation, while it gave them great confidence in the legislature, which had boldly championed the rights of the people. Accordingly almost unlimited powers were conferred upon the legislature, while the governor was deprived of nearly all the customary powers of the colonial executive. He was entrusted with a qualified veto in Massachusetts alone. The appointing power was exercised by the legislature in five of the States, in several they chose the more important officers, while in a few the governor was allowed to share this power with the council. As commander of the military and naval forces of the State the governor presents a more imposing figure than as a civil officer. On the other hand, save for the provisions in the Bill of Rights, almost no limitations were placed upon the powers of the legislature. In addition to strictly legislative power it exercised also important administrative functions, as previously indicated. In several States the upper house possessed certain judicial powers which were brought over from the colonial council, and suggest similar functions of the House of Lords, as the trial of impeachments, and in a few cases it acted as a court of last resort.

The judicial system of the colonies was in general retained under the State governments. While differing in particulars there was a similarity in the organization of this department in all the States. Many of the details were left for statutory enactment. The chief provisions in the constitution related to the method of appointment and removal and the tenure of office of the judges. In Georgia alone the judges, with the exception of the chief justice, were elected by the voters. Elsewhere they were appointed, in about half the States by the legislature, in the others by the governor and council. The usual tenure of the Supreme Court judges was for good behavior, but in most of

the States they were removable. In all the States their salary was fixed by the legislature. The judiciary lacked security and independence owing to its dependence upon the legislature, but fortunately in general that body refrained from interfering with the freedom of the courts.

Property qualifications were prescribed for the exercise of the suffrage in all the 13 States either in the constitution or by law. These varied from the requirement that the elector should be a taxpayer to that of the possession of freehold of the value of £100. In a few States a larger amount was required for the electors of senators than for representatives. In South Carolina the suffrage was further restricted to those who believed in God and in a future state of rewards and punishments. As a result of these provisions the majority of white men were unable to vote. Although freedom of religion was proclaimed in almost every constitution, in several there was a close connection between church and state. In addition to the religious qualifications for office holding already referred to, the legislature was empowered in two New England States to require the support of Protestant clergy at public expense, and in Maryland of the Christian religion. South Carolina declared the Christian Protestant religion to be the established religion. Provision was made for amendment in eight of these constitutions. Five under various restrictions reserved this power to conventions. Three gave the amending power to the legislature, but under such restrictions as a vote by two successive legislatures or requiring a larger majority than for ordinary legislation; in the remainder there was no provision for amendment, thus leaving the power in the complete control of the legislature.

Space does not permit the further analysis of these documents. It should, however, be noted that the later constitutions, as those of New York and Massachusetts, were more complete and more carefully drawn than the earlier ones, their framers profiting from the experience of the other States. All of these constitutions, while republican, were not democratic in character, as judged by later standards. The religious and property qualification, so characteristic of 18th century ideas, gradually disappeared with the advance of the new century, and the chief defects of these instruments, the excessive power placed in the hands of the legislature and the weakness of the executive, were in time corrected. So conservative, however were some of the original States, and so well adapted were these constitutions to serve the purpose for which they were designed, that five of them, although amended, were not superseded for more than a half-century, and one, that of Massachusetts, is still in force.

The period from 1776 to 1780, it has been truly said, is "the most eventful constitution-making epoch in our history." It marks the transition from colonial to commonwealth governments. Moreover just as these constitutions were largely based upon the organic law of the colonies, so in turn they served as models and furnished the chief features for the Federal Constitution. In addition, Judge Jameson has pointed out that from the revolutionary conventions of the earlier part of this period there developed before its close that peculiarly American institution, the constitutional convention,—such as the ones held in Massachusetts and New Hampshire,—which in subsequent years was accepted as the all-important organ for framing the State constitutions. The method these two States employed in drafting their constitutions through a constitutional convention, and its subsequent submission to the voters for their approval, came to be the normal practice followed in the other States in ordaining their organic law. See CONSTITUTION; GOVERNMENT — *Constitutional Government.*

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9. THE PEOPLING OF THE UNITED STATES. During the first 60 years of the 17th century a substantial beginning of the permanent colonization of the Atlantic seaboard had been made. In this work the English, Dutch and Swedes each played a part, but the chief rôle had been taken by the English. Their colonization efforts, at first chiefly prompted by commercial reasons, were feeble. The Virginia colony established in 1607, owing to ignorance, the blundering methods followed and the hardships encountered, increased very slowly. In spite of successive reinforcements and the introduction of the family system its population amounted to only about 3,000 after more than 20 years. The religious and political situation in England was more effective in stimulating colonization than commercial inducements had been. The pioneers of the religious refugees, the Pilgrims, who settled at Plymouth in 1620, after 10 years numbered only some 300. But the triumph of absolutism in church and state led to the great "Puritan Exodus" to New England. During the 11 years that Charles I reigned without a Parliament, 1629 to 1640, some 21,000 immigrants came out. With the outbreak of the Civil War in England, however, this emigration ceased. In the meantime there had been a small immigration to Maryland, which had been founded in 1634, consisting of some English Catholics, but more Protestants, and a constant flow of colonists to Virginia, a considerable proportion of which was of the poorer class. A report

of 1638 states that "scarcely any came but those who are brought in as merchandise to make sale of." By 1640 its population was estimated at 7,500. However, the triumph of the Parliamentary forces caused a great Cavalier movement to Virginia, which not only doubled its population in 10 years, but also markedly raised the character and prosperity of the inhabitants. By 1660 the total population of the English colonies is believed to have been upward of 80,000, about equally divided between New England and the two southern colonies.

Meanwhile in the middle region lying between the two groups of English colonies, the Dutch and the Swedes had planted settlements. The former had taken possession of the Hudson Valley and the western part of Long Island, the latter had a foothold on the banks of the Delaware. The Swedish colonists were never numerous and after 17 years of precarious existence in 1655 their small settlements of 200 or 300 souls passed into the control of the Dutch. The Dutch, more prosperous and populous than the Swedes were much less so than their English neighbors, owing to the narrow policy of the Dutch West India Company, but by 1664 New Netherland had reached a population of 7,000. This, however, was not exclusively Dutch, for even at that early date the future metropolis was a cosmopolitan city. Some 18 different languages were said to have been spoken in New Amsterdam in 1643, and the English had overrun a considerable part of Long Island. The English government, shortly after the Restoration, jealous of the Dutch, decided to wrest the middle region from them. This was accomplished in 1664, and while the Dutch population long remained an important element in New York the Anglicizing process at once began. During the period between the Restoration and the English Revolution of 1689 a few colonists came to New England, more to Virginia and Maryland and a beginning of the colonization of the Carolinas was made, but the greatest immigration was to the middle colonies. East and West Jersey were settled — the former by English direct from England or from the Puritan colony of New Haven, the latter by the English Quakers,— and the "Holy Experiment" in Pennsylvania had made a most prosperous beginning, with its English and Welsh Quakers and a few Germans, the forerunners of the great 18th century migration. By the close of this period the middle colonies numbered about 40,000 inhabitants, or about half as many as New England, while the total population of all the English colonies is believed to have been about 200,000, and by 1700 is estimated by De Bow as 262,000.

During the 17th century the colonies were largely English, but in the 18th century the immigrants were chiefly of other races, nearly all the countries of northwestern and central Europe being represented. Already an important and valuable, although not large French element had been introduced into the population, through the coming of the Huguenots, who, especially in the years following the Revocation of the Edict of Nantes (1685), found their way into nearly all the colonies, but were especially numerous in South Carolina and New York. A number of their descendants became prominent during the Revolutionary period. A few Germans seem to have come to America with the Swedish and Dutch settlements, but it was not until the founding of Pennsylvania that any considerable numbers arrived. Their migration has been divided into three well-defined periods. The first from 1683 to about 1709, during which there was a small immigration into Pennsylvania of perhaps a few score a year, of certain religious sects, chiefly Mennonites. The second period, 1709–27, opens with the coming of the Palatines, thousands of whom, in consequence of the ravaging of the Palatinate by war and the prevailing religious and economic tyranny, had taken refuge in England in 1709 with the hope of being aided to America. Queen Anne's government sent some of them to the Carolinas but more than 3,000 were transported to New York, where most of them in a few years settled in the Mohawk and Schoharie valleys, but a few hundred dissatisfied with their treatment eventually found their way into Pennsylvania. About 1710 Swiss Mennonites and Palatines began to come directly to Pennsylvania, followed by Dunkers and various other sects. By the close of the second period a conservative investigator places the number of Germans in this colony alone as between 15,000 and 20,000. During the third period, 1727 to 1775, the number of immigrants reached enormous proportions. While a few hundred Germans and Swiss found their way directly to some of the southern colonies, especially to the Carolinas and Georgia, by far the greater number came to Pennsylvania. A careful estimate by Kuhns of the number passing through the port of Philadelphia, based upon the lists of arrivals during this period, gives an aggregate of nearly 70,000. Almost one half of these fall within the six years 1749 to 1754. So numerous were the German immigrants that the English and colonial authorities were at times alarmed for the safety of the colony. As will be noted later many of the Germans found their way subsequently to other colonies, but the majority of the authorities agree that in 1775 they comprised about one-third of the total population of Pennsylvania, or about 100,000. Most of these later immigrants did not come for religious reasons, as was the case with the sectaries of the earlier periods, but they were chiefly of the peasant class, who were seeking relief from the burdens of feudalism. They were an honest, industrious, simple and deeply religious people. Content with their new-found prosperity they took little part in colonial politics. Settling together they largely comprised the population of certain counties. So conservative were they and tenacious of their customs and language, that whole communities of their descendants to-day speak a dialect commonly known as Pennsylvania Dutch.

Another equally important non-English element introduced into the colonial population was that of the Scotch-Irish, or better, the Scotch Presbyterians from Ulster, Ireland. Here their ancestors had made their homes for two or three generations, but driven by the religious bigotry of the Established Church, the commercial jealousy of England and the oppression of the landlords, they now sought a refuge across the sea. The emigration began

about the opening of the 18th century, but assumed considerable proportion by 1718. It is estimated that between 1725 and 1768 the number of emigrants rose from 3,000 to 6,000 annually. In consequence of the famine of 1740 it is said 12,000 left Ireland annually for several years for America. It is estimated that fully 50 per cent of these were pure Irish as well as Scotch-Irish. Between 1771 and 1773 some 30,000 departed. Froude says "that ships could not be found for the crowds that wanted to go." As a result of this emigration about one-half of the Presbyterian population of Ulster came to America. Some of these went to New England, several thousand sailed directly to Virginia and the Carolinas, but by far the great majority landed first on the shores of the Delaware and took up their settlements on the frontiers of Pennsylvania and spread from there southward. This colony has been rightly called "the seed plot of frontier emigration," for beginning about 1732 a constant stream of emigrants, composed of Germans and Scotch-Irish folk, flowed to the South and Southwest along the great valleys into the western portions of Maryland, Virginia and North Carolina. Eventually the Scotch-Irish penetrated even further into South Carolina and Georgia. This sturdy and God-fearing people formed the chief element in the population of the frontier counties from Pennsylvania to Georgia, overflowing into what later became Kentucky and Tennessee. It is estimated that the Scotch-Irish comprised about one-sixth of the colonists at the Revolution. The other provinces of Ireland contributed a large quota of the immigrants to the colonies. During the Revolutionary War 38 per cent of the American armies under Washington consisted of these men or their descendants.

The British colonists were in general a substantial and highly moral folk, but it appears to be true that among the indentured servants there was a considerable number of transported criminals. Some political offenders were sent to America, chiefly Scotch prisoners of war. A few hundred captured at the battles of Dunbar and Worcester in 1650 and 1651 were sent to New England. Again, following the suppression of the uprisings in Scotland in 1678 and 1716 and after the battle of Culloden in 1746 companies of Scotch prisoners were sent respectively to Virginia, Maryland and South Carolina. But recent investigation seems to indicate that by far the larger number of convicts sent to America were not political offenders. Some criminals were sent to the colonies in the earlier period, but the practice became more common after the English statute of 1670 and especially after the act of 1718, by both of which transportation to America was permitted in place of capital punishment for certain crimes. The records of Old Bailey alone indicate that between 1717 and 1775 not less than 10,000 were transported. Doubtless in many of these cases there were mitigating circumstances. Proof exists that all the middle and southern colonies served to some extent as penal settlements, but the most of the prisoners appear to have been shipped to Virginia and Maryland. Stith in his 'History of Virginia,' published in 1747, wrote "Virginia has come to be reputed another Siberia, or a hell upon earth." Scharf estimates the number of banished criminals in Maryland at 20,000, one-half entering after 1750. But the servant class was not recruited chiefly from the criminals. The majority of them were honest immigrants, who redeemed their passage to America by being bound out as indentured servants. This class was very considerable in both the southern and middle colonies. They were more numerous and important than slaves in the South during the 17th century, and formed a very considerable and important factor in the economic life of the middle colonies in the following century. Pennsylvania had an especially large number, mostly German and Irish. In addition to the whites, representing almost all the various branches of the Teutonic and Celtic races, there was another large foreign element imported into the colonies, namely, the African negroes, who were held as slaves. Although first introduced into Virginia as early as 1619, they were not numerous during the first half of the century. In the last half, however, they rapidly increased in Virginia and Maryland, so that by the opening of the new century they probably equaled the number of indentured servants in these colonies, and the African slave trade became as important branch of foreign commerce. The growing demand for slave labor on the plantations in all the southern colonies led to a great increase in their number. Bancroft places the total slave population of the English colonies as 59,000 in 1714, 78,000 in 1727, 310,000 in 1760 and about 500,000 in 1775, or approximately one-fifth of the total population. Fully four-fifths of these were in the colonies south of Pennsylvania and comprised about one-third of the inhabitants of that section. Here was a racial element destined in time to affect materially the development of the life and thought not only of the South, but also the political and social history of the whole country.

The steady growth of the colonies during the 18th century is indicated by the following figures. According to the report compiled by the Lords of Trade in 1721 the population had increased to a half million. Dexter, a very careful investigator, estimates that by 1743 it had reached 1,000,000, by 1767, 2,000,000, and was about 2,500,000 at the opening of the Revolutionary War. His figures are in substantial agreement with those of Bancroft. It is probable that about one-third of the population in 1775 were immigrants. The stream of immigration was interrupted by the war, but began again after the return of peace. There is, however, almost no data and even estimates appear to be lacking for the period of the Confederation. It has been estimated that the number of immigrants to the United States in the decade following the first census of 1790 was about 5,000 per annum. This may serve as a rough basis for calculating the number for the preceding decade, although it is hardly probable that it was as large during the unsettled years of the "Critical Period." See also POPULATION.

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10. FINANCES (1775–1789). The fiscal systems of the American colonies were of a simple character; expenditures were small and taxes correspondingly light. Some of the local governments levied excise duties upon articles of luxury; nearly all placed tariff duties upon imports or exports; and the property tax was generally imposed. Illustrations of tariffs are found in tonnage duties, export duties on tobacco, import duties on slaves, and in a few colonies in more extensive tariff schedules on a considerable number of articles of merchandise. Public credit was almost unknown; there were no banks in the modern sense, and consequently no influential agencies for making loans. When emergencies arose, necessitating extraordinary expenditures, the colonies generally resorted to emissions of bills of credit, or promissory treasury notes. In some instances these issues were so large that the notes depreciated in values, resulting in partial repudiation. When hostilities actually broke out in 1775, the Continental Congress found itself without recources and without power to collect reveune; funds, however, were needed at once, and there seemed to be no other recourse than to issue bills of credit. The agitation for separation from the mother-country was in a large measure inspired by the suspicion that England intended to impose a system of taxation without the consent of local bodies; and this suspicion of external taxation extended even to the collection of revenue by the colonies in common. Each commonwealth wished to maintain its revenue powers without abatement even if the object was the good of the whole. Between June 1775 and November 1779 there were 40 emissions of notes with a total issue of $241,000,000. In addition the States put out $209,000,000. These issues rested upon the faith of Congress which repeatedly called upon the several States to provide means for redemption, but these pledges were not made good. The notes consequently depreciated in value, until in 1780 Congress recognized that its efforts were in vain, and made provision for the acceptance of paper in place of silver at the rate of 40 to 1. Depreciation continued until the notes were regarded as worthless. The Funding Act of 1790 provided for the retirement of notes, still in circulation, at a rate of 100 to 1; at this date is was estimated that about $78,000,000 was still outstanding. See MONEY, PAPER.

Congress also sought fiscal aid by making requisitions on the different States, by borrowing both at home and abroad and by attempts to secure national taxation. Requisitions were made both in specie and in specific supplies; the yield of the former was less than $6,000,000, and the demand for specific supplies in the form of corn, beef, hay, etc., proved not only wasteful but ineffective. In order to borrow money, loan offices were established in the several States, at which indented certificates were sold, bearing interest varying from 4 to 6 per cent. In all $63,000,000 was thus borrowed, having a specie value of $7,600,000, according to the scale ot depreciation adopted by Congress in 1780. After 1782 Congress was unable to pay the interest and, therefore, issued to the holders of certificates indents which became current in the payment of State taxes and were receivable by Congress in the payment of requisitions made upon the States. Foreign loans, 1777–83, were obtained as follows: France $6,352,000, Spain $174,000, Holland $1,304,000. Small loans were obtained in France as early as 1777 and these proved of great service in the purchase of military supplies and in the payment of the interest of the domestic loans. Beginning with 1782 bankers' loans were placed in Holland, and fortunately these were continued after peace was restored until the new government was established in 1789. During the years 1784–89, the Dutch loans amounted to $2,296,000. The efforts to secure a national tax were unsuccessful. The Articles of Confederation, which went into effect in 1781, practically granted no financial power to the new government. It was provided that all expenses for the common defense or general welfare should be deferred out of a common treasury supplied by the several States in proportion to the value of land and improvements; and the taxes were to be levied under the direction of the State authorities. In 1781 Congress recommended a duty of 5 per cent on imports, but unanimous consent could not be obtained from the States; in 1783 a more elaborate tariff was proposed. but again the approval of the States could not be secured.

The administrative management of the finances by the Continental Congress well illustrates the jealous attitude of a democracy desirous of maintaining its liberties and fearing all forms of centralized authority. At first there were two treasurers, then a committee of 13 Congressional delegates, followed by a treasury board which handled all public moneys. Finally in 1781 the fiscal machinery was concentrated, and Robert Morris was chosen superintendent of finance. By the use of his personal credit in borrowing funds, he introduced new vigor into the government, but his efforts to create a national system of revenue were fruitless. Through his advice the Bank of North America was established and during the years 1782–83 this proved of aid in making temporary loans to the government.

In 1784 the indebtedness of the national government, apart from the outstanding bills of credit, was $39,000,000, bearing an annual interest charge of $1,875,000. This burden together with the ordinary expenses of government

proved too much, and the national treasury rapidly drifted toward complete bankruptcy. In 1787 a national convention was held to frame a constitution which should endow the government with larger financial powers. The new Constitution gave to Congress the power to lay and collect taxes, and denied to the States the right to lay duties on imports or exports except what might be absolutely necessary for executing its inspection laws. This gave to the government the power it had so sadly needed, and proved to be a firm support when the new government went into operation in 1789. See UNITED STATES — FINANCES (1789–1816).

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11. THE FEDERAL CONVENTION OF 1787. Early in the War of the Revolution the several colonies represented in that revolutionary body, the Continental Congress, recognized that some form of a regularly ordained central government was desirable. It was 17 Nov. 1777, however, before that body could agree upon the draft of a constitution; the Articles of Confederation, and the delay in ratification by the legislatures of the States prevented the new government being established until 1 March 1781. Even before the Articles were drafted the national enthusiasm of the years 1775–76 had cooled, most of the States had meanwhile drawn up their constitutions, and having had the selection of governmental powers there was little left to confer upon the general government, as they held tenaciously to all the powers they had appropriated. The States also became jealous of Congress and of each other. "There was an excess of State pride and a sad lack of national feeling." The change in the spirit of the people was voiced by Rutledge who declared he was "resolved to vest the Congress with no more power than was absolutely necessary," and this accounts in large part for the weak and defective character of the Articles as a plan of government. An additional reason for the weakness of the Articles was that they were not based upon American experience, but were modeled after those European confederations with which Americans were most familiar, namely, the Dutch and the Swiss. It is small wonder, then, that they were not adapted to meet the needs of this country. Even before they went into effect Washington had characterized them as "a shade without substance." The truth of this was soon rendered evident. The short history of the Confederacy is an inglorious one. This government had no self-sustaining capacity, as there was a total lack of coercive power to enforce obedience to its laws. Congress was wholly dependent upon the good will and co-operation of the State governments, as it acted upon them and not upon individuals. Hamilton recognized this as "The great and radical vice of the Confederation," and Randolph subsequently referred to it "as a government of supplication." As soon as the war was over and the pressure of a common danger was removed, there was a tendency toward decentralization,— the general government being regarded as burdensome,— and the authority and character of Congress declined.

In practice the lack of power of Congress to lay taxes soon greatly embarrassed it. It depended wholly upon requisitions on the States for the means of paying the interest upon the debt, contracted to carry on the War of Independence and to meet the current expenses of the government. These were largely neglected or refused. Even before the Articles had gone into effect this defect was anticipated, and as a step toward greater efficiency the Continental Congress recommended, on 8 Feb. 1781, an amendment to the State legislatures, authorizing the general government to lay a duty of 5 per cent ad valorem on imports to pay the foreign debt. All the States consented except Rhode Island. She considered it "the most precious jewel of her sovereignty that no State be called upon to open its purse, but by the authority of the State and by her own officers." Her refusal was sufficient to defeat the project, although Virginia soon afterward withdrew her consent.

In the fall of 1781 Congress made requisition for $8,000,000, but over a year later only $500,000 had been paid. Accordingly, that body again proposed another revenue amendment, 18 April 1783, this time seeking for a grant of power to lay moderate specific duties on certain enumerated articles and 5 per cent on all others for the period of 25 years. As a concession to the States the collection was to be made by officers appointed by them. This proposition met with even a less cordial response than the former one. As late as 1786 four States had failed to give their assent, finally all but that of New York's was secured, but Governor Clinton twice declined to act upon the request of Congress to summon the legislature of that State in special session to reconsider its action, and so defeated the amendment and rendered the financial situation critical, as the compliance with requisitions had grown even more lax. Between 1782 and 1786 Congress had called for $6,000,000, but it received only $1,000,000. Some like Georgia, had paid nothing, nearly all were in arrears, while New Jersey expressly refused to pay its last quota as a protest against the illiberal policy of New York. The impotence of Congress could not be more clearly demonstrated. A committee of Congress in 1786 declared that any further dependence on requisitions would be "dishonorable to the understanding of those who entertain such confidence," and that "the crisis had arrived when the people of the United States must speedily decide whether they will support their rank as a nation by maintaining the public faith at home and abroad."

The failure of the Articles to confer upon Congress power over commerce, either foreign or domestic, proved almost equally disastrous. England refused to grant us commercial rights, realizing that Congress had nothing to give in return and was powerless to retaliate. Congress, therefore, proposed a third amendment on 30 April 1784, asking the States to grant to it for 15 years the power to prohibit the entrance into the ports of the country the vessels of foreign countries not having commercial treaties with the United States. This was especially aimed at Great Britain, and it was hoped

that it would be instrumental in securing favorable commercial concessions from her and other foreign nations, but more than two years later several of the States had failed to comply with the terms of the proposition. This attempt failing, each State was left to regulate trade in its own way, and the way of each differed from that of every other. Not only did it prove impossible to secure a uniform policy toward foreign nations, but they were soon engaged in what Washington termed «a war of imposts» with each other, as each State had a different set of tariff and tonnage laws, which engendered discord, rivalry and retaliatory regulations. Madison thus describes the situation: «The States having ports for foreign commerce taxed and irritated the adjoining States trading through them.» New Jersey, lying between New York and Philadelphia, was compared to a cask tapped at both ends, while North Carolina, situated between Virginia and South Carolina, was likened to a patient bleeding at both arms.

The financial and industrial condition of the States was also very bad. In 1786 the situation was one of general depression, bankruptcy was impending. Seven of the States had sought relief in large issues of paper money. In western Massachusetts the debtor class rose in an outbreak, known as Shay's Rebellion in November of that year, and before it was suppressed had greatly alarmed the friends of law and order and those who respected the rights of property. This outbreak is chiefly important owing to its influence in creating a sentiment favorable to a stronger national government. All signs seemed to point to an early dissolution of the Union. «Our situation,» wrote Madison, «is becoming every day more and more critical. No money comes into the federal treasury, no respect is paid to the federal authority, and people of reflection unanimously agree that the existing confederacy is tottering to its foundation.»

The Articles of Confederation provided for but one way of amendment, but the requirement of securing the unanimous consent of all the States as well as of Congress rendered the amending provision nugatory. Some other means had to be found to reach the people than that prescribed by the Articles, if reforms needed were to be secured, but any other method would be extra constitutional and perhaps revolutionary. Such a means, however, had been already suggested. Passing by the early proposal for a convention by Thomas Paine in 1775, by Alexander Hamilton in 1780 and by Pelatiah Webster in 1781, it is worthy of note that the legislature of New York in July 1782, under the influence of Hamilton, was led unanimously to recommend the calling of a convention to revise the Articles of Confederation. After the news of peace in April 1783, Congress took up this resolution only to defer action, but Washington, in June, addressed communications to Congress and to the governors of the States urging the convoking of «a constitutional convention» «to form a new Constitution that will give consistency, stability and dignity to the Union.» This encouraged Hamilton to present his resolutions to Congress, but without result. At the suggestion of Governor Bowdoin the legislature of Massachusetts, 1 July 1785, adopted resolutions also calling upon Congress to recommend a convention to revise the form and powers of the government. But the States' delegates in Congress disobeyed their instructions and failed to present the resolutions, justifying their action on the ground that «to seek reform through a convention is a violation of the rights of Congress and . . . must meet their disapprobation.» From these failures it was clear that the plan of inducing Congress to initiate the called of a convention was vain. Some more indirect way of reaching the people must be resorted to. Fortunately it was shortly found. Owing to the friction resulting from the conflicting commercial regulations the legislatures of Virginia and Maryland had appointed commissioners, who met in the spring of 1785 to prepare the terms of an agreement for the jurisdiction over the waters common to both States. The legislature of Maryland approved of their report but desired that Delaware and Pennsylvania be invited to join with them in a common system of commercial regulation. James Madison, a member of the Virginia legislature and an advocate of a stronger union, took advantage of this suggestion and was instrumental in securing the adoption by the Virginia legislature, 21 Jan. 1786, of a resolution inviting all the States to send delegates to a convention to be held at Annapolis in September, to take into consideration the question of the commerce of the whole country. Only Virginia and the four middle States were present at Annapolis. Realizing that they were too few for important action, at the suggestion of Hamilton, the convention issued an invitation to the States to attend a new general convention to meet at Philadelphia on the second Monday of the following May, to consider the whole situation of the United States. Virginia at once elected delegates, and six other States did likewise, before Congress took action. Finally, on 21 Feb. 1787, that body was led to give its sanction, although avoiding all reference to the other call, it fixed upon the same time and place for a convention as already proposed, «for the sole and express purpose of revising the Articles of Confederation and reporting to Congress and the several State legislatures.»

The convention was formally organized on 25 May 1787 with the election of Washington as president. For nearly four months it continued in session in Independence Hall, sitting with closed doors, as nothing but its completed work was given to the public. Not till 1819 was its journal published, and Madison's notes, the best report of the debates preserved, were not printed till over half a century after the convention adjourned. All of the States but Rhode Island were represented, although New Hampshire was not present until 23 July. Seventy-three delegates are known to have been appointed, but of these only 55 were in attendance. They comprised nearly all of the men of the greatest experience, authority and ability in the country. All but 12 had served in Congress and knew at first hand of its impotence. Among the delegates — classed by the parties into which they were shortly grouped — may be mentioned as the leaders of the Nationalists, Madison, Hamilton, Wilson, Gouverneur Morris, Charles Pinckney and King; as the champions of the confederation, Paterson, Lansing, Yates,

and Luther Martin, while chief among the advocates of compromise were Franklin, Sherman, Ellsworth, Dickinson, Gerry and C. C. Pinckney. Many difficulties confronted the convention at the outset, owing to the conflicting instructions of the State legislatures and the divergent views of the members. They were at first divided into groups of the large and the small States, those who wished to draw up an entirely new scheme of government national in scope, and those who simply desired to amend the Articles. As the work of the convention progressed other combinations were effected, in which the North was arrayed against the South, or the commercial against the agricultural States. The task before the delegates was to harmonize all these conflicting ideas and interests so that they might be brought to substantial agreement upon a plan which was calculated to command the approval of the people and infuse new life into the Union.

On 29 May, as soon as the convention had been fairly opened, Edmund Randolph presented the Virginia plan, which was probably largely drawn by Madison. It proposed a fundamental change in the government from a confederation to a federal union of States. It made provision for three distinct departments of government, a national legislature, executive and judiciary. The legislature was to consist of two branches, the first branch (representative) to be elected directly by the people of the respective States, the second (senate) by the first branch out of candidates nominated by the State legislatures. Representation in both branches was to be apportioned among the States according to the quotas of contribution or the free inhabitants. In addition to the powers under the confederacy, the Congress should legislate in all cases in which State legislation would interrupt the harmony of the United States, should have a negative on State laws contravening the articles of union or its laws and treaties and might coerce a delinquent State. The executive should be chosen by Congress for a limited term, and with a part of the judiciary should form a council of revision with a limited veto on legislation. An independent national judiciary was provided for. The remaining resolution related to the admission of new States, the guaranteeing to each State a republican form of government, the requirement of an oath to support the national Constitution from State officers, provision for amendment and the ratification of the new Constitution by conventions of the people. This plan was nationalistic in its tendency, although favoring the large States. It became the basis of the Constitution. On the same day Charles Pinckney, of South Carolina, presented a plan of government. The so-called "Pinckney Plan," first published in 1819 in the 'Journal of Congress,' has long been known to be a document of little authority. Recently attempts have been made to reconstruct this plan, and within the last few months a contemporary manuscript has been found giving what is believed to be the chief provisions of this plan. This would seem to indicate that the plan Pinckney actually presented suggested a considerable number of provisions that were incorporated into the completed Constitution, and entitle him to greater credit than he hitherto has been accorded by scholars. It is impossible here to present the details of this draft, but suffice it to say that it was national in character, made provision for the three departments of government, namely, a bicameral legislature — the Senate and House by name — a single executive with the title of President and a Federal judiciary, and suggested several additional features in regard to the powers of the executive and legislative departments.

The debates in the convention naturally fall into three periods. During the first period, from 30 May to 19 June, the proceedings took place chiefly in the committee of the whole. The Virginia plan was under discussion for several days, when on 13 June this plan, somewhat amended, but practically intact, was reported favorably to the convention in 19 resolutions. The chief changes made provided that a national government ought to be established, that the term of members of the lower house should be three years and of the upper seven years, and for the executive one term of seven years, and dropped the clauses for the coercing a State and for the council of revision, leaving to the executive a limited veto. During this discussion the antagonism between the large and small States had become evident, as the provision for proportional representation in both houses had been retained. This would give to the large States of Virginia, Massachusetts and Pennsylvania nearly a majority in both branches of the legislature. North Carolina, South Carolina and Georgia also voted for this provision, probably in anticipation of future growth. This called forth a plan from the small States, which was presented on 15 June by William Paterson of New Jersey, and is generally known as the New Jersey plan. This proposed no change in the basis of the government, which was still to be a confederacy. The existing Congress was to be preserved, but a plural executive chosen by Congress and a judiciary appointed by the executive department with well-defined jurisdiction were provided for. Congress was to be given additional powers to enable it to levy customs duties and internal taxes, and to regulate commerce and for enforcing the payment of requisitions. The acts of Congress and treaties were to be "the supreme law of the respective States," and the executive was authorized to enforce obedience to the same. Once more the Convention went into the committee of the whole to consider these two plans. The issue of a national government or a confederation was clearly presented and on 19 June the committee reported back the Virginia plan. It may be of interest to note that on the day before this, Hamilton, expressing his objection to both plans, sketched the outline of a system which was the embodiment of his views. He advocated a stronger and more centralized government, in which the States would have been reduced almost to administrative divisions of the central government. The assembly was to be chosen by the people for three years, the senators to be chosen for good behavior by electors, and should represent property. The executive to be chosen for good behavior by a more complicated electoral system. He was to be vested with an absolute negative on Congressional legislation. The governors of the States were to be appointed by the central government and were to be given an absolute negative on State legislation. As one of the

delegates remarked, «Hamilton was praised by many but supported by none.»

During the second period of its deliberations, which extended from 19 June to 26 July, the convention was occupied in the discussion of the 19 resolutions agreed to in committee. It was in this period that the great contest between the large and small States, or, better, between the national and confederate parties took place. The nature and character of the new organization was at stake, and was involved particularly in the determination of the question of representation. The large States insisted upon proportional representation in both houses of Congress, the small States refused to enter the Union on any such terms. On 2 July a proposition for equal representation in the Senate was lost. The excitement was intense, the Convention seemed on the point of dissolving. Sherman declared, «We are now at a full stop. Nobody, I suppose, means that we shall break up, without doing something»; and he suggested a committee as «likely to hit on some expedient.» The matter thereupon was referred to a committee of one from each State. They reported 5 July, favorably to equal representation in the Senate and proportional in the House, and as a concession to the large States that the House should originate money bills. To the resolution as reported there was subsequently added the proviso that in the apportionment of representatives and direct taxes «three fifths of all other persons» (slaves) should be counted, which was the rule fixed upon for the apportionment of quotas in the revenue amendment of 1783, and which had been agreed to by the legislatures of 11 States and already had been incorporated in the report of the committee of the whole of 13 June. This proviso should not, therefore, be considered as an essential part of this compromise. This report agreeing to equal representation in the Senate at first excited a storm of protest, but the entire resolution was finally adopted 16 July, by a vote of five States to four, one State being divided and three unrepresented. Thus this compromise, involving the structure of Congress and the organic nature of the government, was determined by a vote of less than a majority of the States present and by the representatives of less than one-third of the people of the States. The effect of this compromise was most marked. The small States now gave up their opposition to the reorganization of the government and joined heartily in the work of providing an efficient organization and adequate powers for the new government. The other important modifications of the plan made during this period were substituting for the phrase «National Government» the «Government of the United States,» shortening the term of representatives to two years and of senators to six years, and providing that the latter should retire by thirds, omitting the provision for the negative on State laws and inserting «the supreme law» clause first suggested in the New Jersey plan. Some of these changes show a departure from nationalism in the direction of federalism, and indicate that the spirit of compromise was at work. On 24 July a «Committee of Detail» was appointed to prepare the draft of a Constitution conformable to the resolutions adopted by the convention. Two days later the 23 resolutions already agreed to together with the Pinckney and New Jersey plans were referred to this committee. Then the Convention adjourned until 6 August to await the committee's report. On that date they reported the draft of a Constitution in which the main features of the completed Constitution already appear.

We now approach the third period of the work of the Convention, extending from 6 August to 17 September. During these six weeks the debate over the details of the draft progressed, and while great diversity of opinion was exhibited, it proceeded in the main without undue excitement, although the difference in the interests of the Northern and Southern States over commerce and slavery aroused for a time considerable excitement. Already during the preceding period it had become evident, as Madison records, «that the real difference of interest lay not between the large and small States, but between the northern and southern States. The institution of slavery and its consequences formed the line of discrimination.» But these yielded, as in the case of so many other issues, to compromise. In regard to commerce it was agreed that Congress might regulate foreign and interstate trade but should not have power to lay any export tax. This was a compromise between the commercial States of the North and the agricultural States of the South. Again the Northern States desired that Congress should have power to pass navigation acts, but the three extreme Southern States objected, and refused at first to sanction the power except by a two-thirds vote of Congress for fear that the slave trade might be interdicted. The situation became critical, and again a committee of one from each State was resorted to. On 24 August they reported a compromise which as amended provided that Congress should not prohibit the slave trade prior to 1808, but might impose a tax not to exceed $10 per head on such importations. This was carried by the votes of New England and those of the Carolinas and Georgia. By a similar combination of votes the clause requiring a two-thirds vote to pass navigation acts was defeated. It is noteworthy that the Virginia delegates earnestly opposed this compromise. Subsequently the provision in regard to the rendition of fugitive slaves was agreed to. This probably formed a part of the above-mentioned compromise. These compromises were severely condemned by later generations who forgot that slavery at that day hardly was regarded as a great moral issue. It is altogether probable, also, that these compromises generally have been over-emphasized and that others, perhaps of equal importance, have been overlooked. Certainly it is true, as has been well said, that «the Constitution is a series of compromises.» No question gave the framers of the Constitution so much trouble as the choice of the executive. The Convention vacillated between several plans and showed a strange fluctuation of sentiment. Several times it voted in favor of election by Congress; once it agreed to a choice by electors chosen by the State legislatures—a plan subsequently twice rejected. After repeated reconsideration the special committees in their report of 4 September recommended the electoral system very nearly as it was finally adopted on 6 September. This was regarded as a compromise between the large and the

small States, as by many it was expected that the ultimate election would usually devolve upon the House voting by States. Thus it was said that the large States would nominate while the small States would elect. Over the organization of the executive, also, there was great difference of opinion between those who desired a strong executive, vested in one man, and those who feared an approach to monarchy. These conflicting ideas were compromised by conferring upon the President great powers, but giving to the Senate or both branches of Congress certain checks and limitations upon the exercise of those powers.

It is impossible to enter further into the details of the convention. Suffice it to add that on 8 September, when the members approached substantial agreement on the chief provision of the Constitution, a committee of five on "style and arrangement" was appointed. This committee made its report, largely drawn by Gouverneur Morris, on 12 September. It was arranged in seven articles with the various sections as in the present Constitution. Discussion upon this report continued until the 15th, when the Constitution as amended was agreed to. On Monday, 17 September, the draft of the Constitution was signed by 39 of the delegates and the convention adjourned *sine die*. Three delegates present, Gerry, Mason and Randolph, refused to sign, owing to the strong national features of the document, and to the rejection of the proposal to hold a second convention to consider amendments that might be recommended by the State conventions. There is evidence that only four of the 13 delegates who had been in attendance, but were absent at the time of adjournment, were opposed to the Constitution; certainly the majority approved of it.

It has been truly said that "if Americans possess political genius to any degree, it is for adapting old institutions to new needs." The work of the framers of the Federal Constitution strikingly illustrates the force of this statement, and the institutional development of our fundamental law. The framers drew largely upon their experience both during the colonial times and under the State governments, and the chief features of the Constitution are but a selection and adaptation of the provisions of the contemporary State constitutions. The Constitution made provision for the establishment of a government which was neither wholly national nor wholly federal, but partaking of the features of both. It provided for a mixed system. As Madison remarked, "In some respects it is a government of a federal nature, in others, it is of a consolidated nature." Thus in the legislature, consisting of two bodies, the Senate is based upon the federal, the House upon the national principle. In the new organization of the government the legislative department was improved, the executive and judiciary were substantially created. All were modeled in large measure after the similar departments in the State governments. The powers of the general government were greatly increased, while those of the State governments were correspondingly decreased. Certain express limitations were laid upon the latter and certain other powers were denied both to the State and to the Federal governments. The convention by a tie vote refused to add a bill of rights, as the opinion prevailed that such a guarantee of individual rights was unnecessary as the Federal government was one of delegated powers only. By providing that the ratification of nine States should be sufficient to establish the new government the work of the convention was revolutionary.

In accordance with its resolves the Constitution was transmitted to Congress and after some attempts to amend, that body finally agreed unanimously 28 September, in accordance with the desire of the convention, to transmit the Constitution to the legislatures of the several States to be submitted to State conventions. At once there sprang up a great pamphlet and newspaper contest over the merits of the proposed frame of government. The most famous of these was a series of letters in advocacy of the Constitution written by Hamilton with the aid of Madison and Jay, subsequently collected under the title of 'The Federalist.' These exerted a profound influence throughout the country. 'The Letters of the Federal Farmer' by Richard Henry Lee, one of the foremost opponents of ratification, had the widest circulation and were the most effective of the pamphlets on the other side. The country was shortly divided into the Federalists and the Anti-Federalists. The former comprised chiefly the professional and commercial classes, who favored the new government because it would promote national credit and commercial intercourse. The Anti-Federalists were mainly the agricultural classes, who were the advocates of paper money, stay and tender laws and who opposed increased taxation. Geographically the strength of the Federalists was near the seacoast and in the few important valleys which were the highways of commerce inland, while that of the Anti-Federalists was in the interior and agricultural sections.

Hardly a provision of the Constitution escaped criticism, but the absence of a bill of rights was the most common and weighty objection raised. The fear that the strong general government provided for would encroach upon the sovereignty of the States and the liberty and rights of the individual was the chief obstacle to be overcome. The first State to ratify was Delaware (7 Dec. 1787), followed in the course of a month by Pennsylvania, New Jersey, Georgia and Connecticut. In three of the States the vote was unanimous, and in Pennsylvania and Connecticut ratification was carried without difficulty, although in the former State there was a vigorous but small opposition. The first close struggle occurred in Massachusetts. The convention was very evenly divided and ratification was only secured (7 Feb. 1788) by a narrow margin, through the Federalists agreeing to the recommendation of a series of amendments. This plan was followed by all the subsequent conventions save Maryland, which ratified in April. All except five States had now taken favorable action, but it seemed very doubtful if any one of the five remaining States could be brought to accept the Constitution unconditionally. The Virginia convention was the first of these to assemble, but the discussions were so prolonged that New Hampshire ratified before it, on 21 June, by a majority of 11, making the ninth State, and thus ensuring the inauguration of the new system. Virginia followed on 25 June, by a majority of

10 votes in favor, out of 186, under the impression that it was the ninth State to take action. The effect of these two ratifications upon the New York convention was fortunate. At first the opponents to unconditioned ratification had been in the majority. Finally a few of the opposition yielded sufficiently to permit of ratification by a majority of four, but this action was secured only by the Federalists consenting to a call for a second general constitutional convention to consider amendments. Happily this convention was never held. It has been impossible to refer to the important influence of certain men in the State conventions, but at least passing note should be made of the astuteness of the Federal leaders in the Massachusetts convention, of the heroic services of Hamilton and Madison and the strenuous opposition of Patrick Henry and Lansing in their respective State conventions. Favorable action had finally been secured in the doubtful States, owing to the realization that the alternative of "the Constitution or disunion" was before them to choose from. John Quincy Adams truly said, "The Constitution was extorted by grinding necessity from a reluctant people." Of the two remaining States, the North Carolina convention on 2 August refused to ratify without a bill of rights and the Rhode Island legislature repeatedly refused to call a convention. Finally, after the new government had been inaugurated, and Congress, in response to the general demand for a bill of rights, had submitted a series of amendments to the States, North Carolina ratified 21 Nov. 1789, but Rhode Island's adherence was not secured until 27 May 1790, by a majority of two votes, and only then as a result of threatened hostile commercial legislation by Congress. Thus the 13 original States were finally reunited under the new Constitution. See CONGRESS, CONTINENTAL.

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12. BEGINNINGS OF PARTY ORGANIZATION AND GROWTH OF THE PARTY SYSTEM AND PARTY MACHINERY. Political parties so-called have existed in the United States from the beginning of its independent national life. Even earlier, while the colonies owed allegiance to the governments of Europe, there were traces of political divisions and groupings among the colonists according to their inclinations to sympathize with one or another of the political groups contending for power in the old home, or according to their differing views upon colonial and local affairs. But party organization there was none until near the end of the 18th century. Federalists and Anti-Federalists were the parties of the great discussion upon the adoption of the Constitution, but they were unorganized groups of the leaders of opinion and their supporters, divided by their opposing views upon the sole question in debate. After that contest had been ended by the triumph of the Federalists the party names persisted for a time, and the divisions were upon questions of constitutional interpretation. No organs were developed for perpetuating these early parties or for enlarging their political functions. The beginnings of a form of organization which did permanently affect the development of the oldest of our true American parties appear during the first administration of Washington in the Democratic clubs that sprang up and spread rapidly through the country. These were in some cases organized in a manner remotely comparable to the organization of a modern party and did effective service in strengthening the group which supported the views of Jefferson. They were, however, discredited by the turn of events and their development was checked.

Party organization arose out of the search for methods of political action which would secure in a representative democracy the choice of men as servants of the people who would be truly acceptable to the people. To this end and in order that the electoral forces might not be scattered and lost, it was found necessary to make use of some form of nomination of candidates previous to an election. After the adoption of the Constitution the irregular and varying local methods previously in use (the secret caucus, the open public meeting, the local unorganized convention, assisted by systems of correspondence and consultation) were rapidly extended and made more effective, while more central agencies of nomination for State and national officials were developed. The difficulties and expense of travel led to the rise of the legislative caucus system for the nomination of State officers as early as the year 1790. The opposing parties were both represented in the State assemblies by prominent members and it seemed but a natural expansion of their regular duties that they should choose suitable candidates for the State offices. Their recommendations were made known by proclamations signed by members of the caucus. Against constant and severe criticism the legislative caucus continued in most of the States to exercise the power which had almost by accident fallen into its hands down to the year 1824, and even later in a few States; then, under the pressure of popular demand, it gradually gave way to the growing convention system. In many instances during the period of its prevalence the legislative caucus of the States assumed the privilege of nominating Presidential candidates.

The last years of the 18th century were

marked by the rise of a distinct party organ for the nomination of national elective officers. This was the Congressional caucus which was of an origin similar to that of the legislative caucus of the States and grew out of the practice of the Federalist members of Congress of meeting, with more or less formality and official sanction, for the discussion of party policy. It was easy to carry over into the field of nomination the party power in their hands. Hamilton is credited with suggesting the first formal action of the Congressional caucus of the Federalists in favor of a candidate for the Presidency in 1800, and so of originating the party organ. Evidences of such use of the Republican party caucus are to be found, however, in the history of the previous campaign. Both parties did so nominate candidates for the election of the year 1800. The efficiency, convenience and economy of the new agency, together with a natural human reluctance to surrender power once grasped, led to its continued use against constant and growing popular opposition. It was seen to have become fully established as a party organ when, in 1808, the Republican caucus was called by the senator who had presided over that of 1804, "in pursuance of the powers vested in him." By the Jeffersonian Republican party it was made so able and efficient a party engine as to render the acceptance of its decisions a practical test of party loyalty, not only in the official circle but throughout the rank and file of party membership in the country. Party discipline was firmly enforced and the Republican representatives in Congress saw that the behests of the caucus were respected in all the States. The nominating agencies in the States were manipulated in a manner to strengthen the national party organ, and the minority became almost helpless before it.

No method for choosing Presidential electors was prescribed by the Constitution, that matter being left to each State to determine for itself. Three systems were employed in the early elections. In some of the States the legislatures chose the electors. In others candidates were nominated in large assemblies of prominent citizens, including members of the legislature, which foreshadowed the State conventions of later days. Names so chosen were placed upon the general ticket of the party. Other States elected the electors by Congressional districts. The general ticket system gained ground over the others until by the year 1860 it was practically universal. The supremacy of the Congressional caucus, supplemented as it was by the power of the legislative caucus in the States, transferred the political authority of a free, democratic people to the hands of a few powerful leaders. The effects of the popular dissatisfaction with this form of party organization were apparent first in the yielding of the caucus in some of the States. The districts where the party was in a minority complained that they were unrepresented in the legislative caucus, and in concession to their demands a modified form of the caucus began to be used (first in Rhode Island) about 1807. This was known as the "mixed caucus," and was composed of the party members of the legislature together with delegates elected by the party in the districts in which the party sent no representatives to the legislature. Some 10 years later still further concession was made to public sentiment (first in Pennsylvania), by substituting a "mixed convention" for the mixed caucus. This also was made up of delegates popularly elected in the counties, along with members of the legislature, but the members of the legislature were permitted to sit in the convention only when they represented counties from which no special delegates had been chosen.

From 1817 to the final overthrow of the legislative caucus, which for nearly all of the States was completed in 1832, the mixed convention was preparing the way for the advent of a truly representative nominating machinery, the State convention. Pennsylvania was again the first State to take the advance step. In like manner the Congressional caucus gave way slowly before the popular distrust, but its ultimate destruction became certain when, in 1816, it manifested a determination to force upon the Republican party an unacceptable candidate for the Presidency. It was called again in 1820, but, in the face of the manifest temper of the people, decided to take no action. In 1824 it did once more and for the last time put forth candidates, but only a minority of the party members of Congress participated and it commanded no respect.

The Federalist party received a mortal blow in the election of 1800 and was slowly dying throughout the period of the dominance of the caucus. It held no more national caucuses, but in a variety of ways announced its candidates. In 1812 the Federalists held what has been called, though improperly, the first national convention. It was composed of delegates from 11 States, who met as a peace party to oppose the war with England. They adopted the candidates already nominated by the Peace Republicans, who had "bolted" the regular party ticket. During the unsettled period between the Congressional caucus and the national convention, State and local party agencies of diverse forms acted as nominating bodies. The legislative caucus was still active in some States; the assemblies themselves, as such, sometimes chose candidates; mass conventions, county conventions, district conventions and popular mass meetings, all nominated Presidential candidates, and some of those gatherings tooks pains to declare that they would not be bound by the proceedings of an Congressional caucus. All available means were made use of to render clear the final condemnation by the people of the objectionable party organ. Having been tried and found wanting, it was swept aside, to give place to any agency more in consonance with the national spirit. Though a Congressional party caucus is at the present day an acceptable part of the national party organization, it does not exercise the nominating function.

Nomination by conference or by preliminary meetings of party supporters which might be called conventions, had always been practised in the States and local areas and the use of a convention for nominating the chief executive officers of the nation was the application of a principle already familiar to the people. The first of the long series of modern national nominating conventions was that of the ephemeral Anti-Masonic party, which met in Baltimore,

8 Sept. 1831, having representatives from 13 States. A long "Address to the People of the United States" set forth the principles of the party somewhat after the manner of the platforms of later years and Presidential candidates were nominated. The political importance of this convention is not great, and it is significant only as standing first on the list. The two leading parties quickly adopted the convention method in national politics. In December 1831 the National Republicans — successors to the Federalists and predecessors of the Whigs—met in pursuance of a call by a legislative caucus in Marlyand. All opposed to the existing administration of Andrew Jackson were invited to send delegates. Eighteen States and the District of Columbia responded and the convention laid plans for rendering the new organ a permanent part of party machinery. The first Democratic national convention, which met in May 1832, was called by New Hampshire politicians and was composed of delegates from all the States except Missouri. The National Republicans were now giving place to the Whigs, and in the unsettled state of political affairs that party held no national convention in 1836, but legislatures and legislative caucuses put forth candidates. A Democratic convention was held, and that party has thenceforth convened with uninterrupted regularity in national convention to nominate party candidates for Federal elective office. By the year 1840 the Whigs also were equipped with adequate machinery and held their nominating conventions with regularity thereafter.

The national convention cannot be said to have become a permanent part of the party organization until it had provided for its own perpetuation. This was accomplished first by the Democrats when, in 1848, a national central committee, consisting of one member from each State, was appointed by the convention, one of its duties to be the calling of the next succeeding national convention. Similar action by the Whigs in 1852 completed the organization of that party. Previous to that year Whig conventions had been called by a Congressional caucus or by a legislative caucus of some one of the States. Tributary to the national convention, which is, in theory, the gathering up of the myriad expressions of political opinion throughout the whole country, is a long series of State conventions, district conventions, county conventions, city conventions, until the unit of party organization is reached in the ward or township primary, or caucus, made up of individual voters. All this complex machinery is kept in condition for effective action by means of committees appointed in the various election areas. Details of the system vary widely in the several States, but each State has its State central committee with a general supervision of the subordinate party agencies of the State. The national committee consists of one member from each State and Territory. It has general charge of the national interests of the party. Next in rank is the national Congressional committee, first appointed in 1866 by a Republican Congressional caucus. A few years later the Congressional caucus of the Democratic party took similar action. The Republican Congressional committee consists of one member of Congress from each State or Territory represented by a party member. In the Democratic Congressional committee a State or Territory having no party member of Congress is represented by an outside member of the party. It is the duty of the Congressional committee to supplement the action of the State and national committees and more especially to take charge of the elections of members of the lower House which occur midway between two Presidential elections. In this matter the committee co-operates with local committees in the Congressional districts of the various States. The party committees hold a most important and responsible position in the organization. They are the permanent party officials who formulate the party rules, administer the enormous party funds and have general control over party business.

Since about the year 1880 the convention system has undergone considerable modification in the direction of legislative control of nominations. Under the fully developed system direct nomination is confined to the local officers in precinct, ward or township where the primaries are held. Here the individual members of the party by their direct votes nominate the party candidates for local office. Candidates for the larger areas of city, county, judicial district, Congressional district and State are nominated indirectly by delegates chosen at the primaries. Two methods of procedure are in use at the primaries. The older is that of the mass meeting of party voters, most commonly called the caucus. It is organized by electing a chairman and a secretary and the voting for local candidates or for delegates may be by ballot or by any method prescribed by party rules or by vote of the members present. The newer method is that of the primary election, which substitutes for the mass meeting a regular election held under the control of party or State officers, where qualified members of the party cast their votes one by one, for candidates for office or for delegates to nominating conventions.

The adoption of the primary election system does not necessarily do away with the nominating convention. Direct nomination may still be limited to local officials; but the primary election method admits of being indefinitely expanded, as the mass convention or caucus system does not. It may be so extended as to perform all the functions of the various conventions within the State, and this it is which makes the introduction of direct election in the local areas of special significance. Instead of calling upon the primaries of a county to choose delegates to attend a county convention for the purpose of placing in nomination candidates for county offices, the county committee may notify the party electors to proceed, at a certain time and place, to vote directly for candidates of their own choice. In such a case the primary elections held in the several precincts of the county supplant the county convention and exercise its functions. In like manner a Congressional district composed of several counties may provide for choosing the party candidates for the House of Representatives by direct vote at the local primaries of the district, thus doing away with the need of a Congressional nominating convention. In the same di-

rect way candidates for judicial and State offices may be nominated and the convention within the State be wholly displaced.

The discontinuance of the convention involves radical changes in party organization. The permanent committees, the platforms, the rules for the control of party conduct, have all been the product of party conventions. When the convention disappears all party functions devolve upon the primaries and the officers chosen by them.

It has been proposed also to abolish the national nominating convention and transfer to the primaries the additional duties of nominating candidates for the Presidency by direct vote, formulating quadrennially the national party platform and choosing the national committee. But there is a natural distinction between national and State politics. Issues arise within the States which have no direct relation to national affairs, and which furnish a natural line of cleavage for the parties. For the formulation of party issues and the development of party policies the convention is found to be a more convenient agent than the primary. Some of the States in which direct nomination is extensively practised still retain the State convention for nominating State officers and promulgating the State party platform. Where the State convention has yielded to the movement for direct nomination, party issues are formulated by party officeholders, by party candidates and party committees or by direct vote at the primary election, or by convention assembled for the purpose.

The primary election system was first introduced in those Southern States in which one political party has control and a nomination is equivalent to an election. Here the real contest is within the ranks of the dominant party at the primary. The party members there vote directly for the various candidates, the votes are canvassed and it is made a point of honor to abide by the decision so rendered. So important is the primary election that more votes are cast at it than at the legal election which follows. Some of the States — Mississippi, for example — have passed laws for the regulation and control of the primary election. In other States, as Georgia, the dominant party holds a similar election under rules formulated by the party organization.

But the development of the primary election system is by no means confined to the South; it extends to all sections of the country. Its object is to give to the unofficial members of the party greater power of control. The development of the system has coincided with the introduction of the Australian ballot legislation. These new laws require the State to print and distribute the ballots. This had formerly been an important party duty. Before the State officer can print the ballots he must have official information as to the names of candidates; the laws, therefore, prescribe a formal process of nomination by petition; but the real nominations are made by the political parties, and since the laws require some sort of official recognition of the nominating process, the State legislatures have been the more ready to yield to the already existing demand for legislation on the subject of primary elections. The result is that in many States the ordinary party machinery is becoming subject to State regulation and control. In 1901 the State of Minnesota passed a law providing for the holding of a primary election for the nomination of candidates to be voted for at the general election. The Minnesota primary election under State supervision is for all parties, who must all vote at the same place and on the same day. This provision makes it easier to confine the vote of each party to its own members. Under this law the candidates for State offices are not subject to nomination at the primary. The object of this exception was to preserve the State convention and render it convenient for party leaders to meet in conference and make declarations of party principles. Numerous States have since adopted a compulsory primary system. Many of them require State as well as local officers to be thus nominated.

State control of party nomination leads to legal definition of party membership. Only members of the party have a right to vote at the primary. In Massachusetts, participation in a primary election of a given party disqualifies a man for voting at the primary of any other party for the ensuing 12 months without a formal legal notice of a change of party choice. Direct nomination at a primary election creates a demand for preliminary nomination of candidates, more or less formal, within the party itself. Party caucuses and conferences are utilized for this purpose. See DEMOCRATIC PARTY; REPUBLICAN PARTY; WHIGS.

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13. THE COLONIAL AND TERRITORIAL SYSTEMS. Under the generally well-known name of "territorial government," the United States has developed one of the best systems of colonial government that has ever existed. When, acting under the suggestions of Maryland, several of the colonies between 1780 and 1784 surrendered to the Federal authority their claims to lands west of the Alleghenies, some provision had to be made for the government of them. This was done by the Ordinance of 1784, which provided for (1) the division into States; (2) the establishment of temporary government; (3) the establishment of permanent governments and the admission of the prospective States into the Union as full States when a certain number of population had been reached; (4) the maintenance of a republican form of government in the States; (5) and the subjection of each new State to the Articles of Confederation. Grayson's Land Ordinance of 1785 made provision

for (1) the survey of the lands; (2) its division by north and south and east and west lines into townships six miles square; (3) and finally its sale in lots to purchasers. By 1787 all of the land north of the Ohio River, known as the Northwest Territory (q.v.), had come under the jurisdiction of Congress. Meantime an emigration company, called the Ohio Company (q.v.), had been formed in Massachusetts for the purpose of exploiting and settling these western lands. It had failed of success partly because settlers were unwilling to go to a land where so little guarantee was made for personal rights as in the Ordinance of 1784. The head men of the company, therefore, petitioned Congress for legislation which would give the guarantees desired. The result of this petition was the passage of the Ordinance of 1787. This contained the personal rights asked for, such as trial by jury, habeas corpus, etc., made arrangements for the treatment of the Territory as one, or later as two, districts, and made provisions for two successive forms of territorial government. At first a governor and three judges appointed by Congress were to act as a legislature, as well as fulfil their own special functions as executive and judiciary. When there were 5,000 free male inhabitants of full age in the district, they were to receive authority to elect a general assembly or lower house of a legislature but the upper house or legislative council of five members was to be appointed by Congress from a list of 10 names submitted by the lower house. The two houses meeting jointly were to choose a delegate to Congress who was to have a seat and the right of debating but not of voting. The governor, judges and administrative officers were still appointed by Congress. The keystone of this ordinance and that which placed the American colonial system above all other systems was the provision which allowed the division of the Territory into three to five parts and when any one had 60,000 inhabitants it was to be admitted to the Union on an equality with the other States.

The Northwest Ordinance has formed the basis for all later territorial governments in the United States. As strong doubt was expressed as to the right of Congress of the Confederation to pass such a law, the first Congress under the Constitution confirmed the ordinance by the Confirmatory Act of 1789 and gave to the new President all the powers therein exercised by the old Congress. This it was enabled to do under the clause of the Constitution which reads that Congress shall have power "to dispose of and make all needful rules and regulations respecting the territory or other property belonging to the United States." In 1796 Congress passed, for the territory south of the Ohio River, an ordinance which was almost the same as the Northwest Ordinance.

With the great additions of territory (see TERRITORIAL EXPANSION) to the United States by the Louisiana and Florida purchases and subsequent wars and treaties came the necessity of providing territorial governments. All of these were very similar to that outlined in the Ordinance of 1787. As all of the land now comprised within the United States, with the exception of the original 13 States, Vermont, Kentucky, West Virginia, Texas and California, was at one time or another under territorial government, it is easily realized how important a good colonial or territorial system of government has been to the United States. The territorial governments, on account of their common basis, have been very similar, even though entirely dependent on the will of Congress. At the head of each territorial government stood the governor. He, with any administrative officers needed, was appointed by the President for a term of four years and was removable by him with the consent of the Senate. In earlier times the governor was usually sent out from the East, but later some man prominent within the Territory was chosen. The President also appointed judges for the Territories for terms of four years. The male inhabitants of the Territory, of full age, were allowed to elect a legislature of two houses, a council and a house of representatives. The legislature could pass laws on a large variety of subjects and arrange for local and municipal governments. The governor, however, had a veto on any laws, but they could be passed over his veto. Congress could at any time override statutes passed by a territorial legislature. This, however, was not often done. The Territory had the privilege of sending a delegate to Washington, to sit in the House of Representatives. He has the salary and all the rights and privileges of a regular member of that House, except the right to vote. Congress could, of course, withdraw a territorial government at any time, but this was seldom done. When the Territory reached a certain population (the number has varied much), Congress could admit it as a State by ratifying and accepting a constitution already drawn up by the people, or it could pass an Enabling Act. Under this the voters elect a convention to draft a constitution. If this was accepted the Territory forthwith became a State on an equality with other States of the Union. Congress at times imposed certain conditions in the Enabling Act. Whether these conditions were binding on the State if it afterward disregarded them is a mooted point.

Besides the Territories organized as above, among which the Hawaiian Islands, acquired by annexation in 1898, may be included, there were at times certain lands under the jurisdiction of the United States, which may be called unorganized territories. These were Indian Territory and Alaska. In both of these the population was largely Indian and that accounts for their different treatment. Indian Territory had a government with a legislature, but it sent no delegate to Congress like the other territories, had no organized government like theirs and in reality was only a form of local government which Congress permitted to exist for the time being and which it could abolish at pleasure without feeling that it was violating any of the rights or privileges which in the organized Territories were looked upon by the inhabitants as guaranteed to them by a compact with Congress. Alaska did not have for a time as complete a government as Indian Territory. By an act of 1884 Congress provided for a governor and a District Court. Owing to the influx of white people at the time of the discovery of gold in the Klondike, Congress had to pass acts in 1899 and 1900 making more careful regulations for the government. In 1912

Alaska was organized as a Territory with a government similar to that given to the older Territories, but with more subjects referred to Congress for legislation.

The United States had to confront new problems in the government of colonies or Territories when Porto Rico and the Philippines were acquired in 1898. These islands could not be treated like the older Territories of the United States. There were those, however, who held that they were the same and that all laws passed for the United States were applicable to these outlying domains in the same way as they were to the Territories within the United States. Still others maintained that such was not the case and that laws passed for the United States did not apply to Porto Rico and the Philippines. The latter view was upheld by the Supreme Court in the Insular Cases decision in 1901. This made possible a new colonial system of government for the United States and brought about the abandonment of the principles of the Ordinance of 1787, so far as these island possessions were concerned. A special kind of government was accordingly worked out for Porto Rico and another one for the Philippines. Porto Rico had a governor and other administrative officials appointed by the President, a legislature of two houses, the upper one largely appointive and the lower one elective. The old court of the Spanish régime, including the municipal courts, were retained, but the island was organized as a new judicial district of the United States. The district judge, district attorney and marshal were appointed by the President. The qualified voters of the island every two years chose a resident commissioner to the United States who was recognized as such by the departments at Washington. By the Act of 1917 the people of Porto Rico were made citizens of the United States, the upper house was made entirely elective and other changes looking to a government almost comparable to that of the States were made. The governor is still appointed by the President and Congress may annul acts of the legislature. For the Philippines a still more exceptional form of colonial government was established. The inhabitants were allowed to participate in the municipal government, but were not allowed to have a representative legislature. The executive power was in the hands of a commission of five members appointed by the President. By subsequent acts and especially by one of 1916 more autonomous government was given. Though the governor and some other officials are appointed by the President there is a legislature of two houses elected by the people and it elects two commissioners to go to Washington. No provision has been made for the eventual admission of either Porto Rico or the Philippines to statehood.

Guam, Tutuila (Samoa) and the Panama Canal Zone are under military governors appointed by the President. The Danish West Indies just acquired are under a temporary government by the boards with governors appointed by the President.

With the addition of these outlying dependencies to the jurisdiction of the United States the high ideal of colonial and territorial government set by the Ordinance of 1787 has eventually been followed. The United States has found that it has had to handle for a time these outlying domains in much the same way as England, France and Germany handle their colonies and with little regard to those principles which were so vigorously upheld in the Declaration of Independence. Gradually, however, it puts into operation the principles for which it has always stood. In addition to the Territories, organized and unorganized, and to the dependencies, the United States now provides for the government of the District of Columbia, national forts and sites and Indian reservations. The regulations for these, however, scarcely form a part of the colonial or territorial system of government. The same is true of the virtual protectorates which the United States exercises over Cuba and Panama.

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14. THE CABINET. The Cabinet, as the name is used in American affairs, is the President's council. It is composed of the heads of the nine great executive departments. Four of these are older than the government under the Constitution, for the Old Congress had found it necessary to establish a Department of Foreign Affairs, of the Treasury, and of War. The Post Office Department was established by the Continental Congress before the Declaration of Independence. The framers of the Constitution assumed that such departments would continue to be necessary. They perceived also that the heads of these should be at the service of the chief executive. Hence the provision that he — "the President — may require the opinion in writing of the principal officer in each of the executive departments, upon any subject relating to the duties of their respective offices." The first Congress under the Constitution re-established the executive departments already existing. To the Foreign Office it added certain internal affairs, and changed the name to the Department of State. The office of Attorney-General was also established in 1789, being provided for by the great act that established the Federal courts. In 1870, 22 June, the Attorney-General was made the head of a Department of Justice. Four additional departments have been created as the expansion and progress of the country have demanded. The Department of the Navy was established in 1798, 30 April; the Department of the Interior, in 1849, 3 March; the Department of Agriculture, in 1889, 9 February; the Department of Commerce and Labor, in 1903, 14 February; and the Department of Labor, in 1913, 4 March. Although the Constitution refers in two places to the heads of departments, it does not imply that they are to form a council to advise the President on questions outside of their respective departments. The distinction between the two functions is illustrated by the following episode. During the interval, 21 February–28 May 1868, Secretary Stanton was on duty at the War Office, while Lorenzo Thomas, who had failed to get posses-

sion of the office, was attending the Cabinet sessions. Left without a council by the Constitution, Washington sought one for himself. At first he turned to the Senate. He had constitutional authority for advising with this body on the two subjects of appointments and treaties. But his visits to the Senate chamber were coldly received. At the same time he singled out certain men whom he consulted as individuals. On 27 Aug. 1790, he formally requested written opinions, on a question of general policy, of Hamilton, Jefferson, Knox, Randolph, Jay and Adams. These men were respectively the Secretary of the Treasury, Secretary of State, Secretary of War, Attorney-General, Chief Justice and Vice-President. On 4 April 1791, the President addressed a letter to the three secretaries which brought about the first cabinet councils to which there is any reference. The occasion was his own absence from the seat of government. He herein expressed the wish that if any important cases arose during his absence, the secretaries of the Departments of State, Treasury and War may hold consultations thereon to determine whether they are of such a nature as to demand his personal attendance at the seat of government. If the Vice-President is at the seat of government, the President wishes that he also be consulted. One or more consultations were held agreeably to this suggestion. Besides the officers specified, the Attorney-General was present. During the year 1792, the three Secretaries and the Attorney-General occasionally met the President at his house for consultation. But it was in 1793 that frequent consultations gave the council a definite place. The circumstance of this was the conduct of Minister Genet. In August of this year, Jefferson referred in his diary to the President's council as "our cabinet." In the administration of John Adams the word was quite commonly used. It has never been introduced into the laws; but it can be found in the debates of Congress and in the President's messages. The rule that Washington followed in the choice of his counsellors was to summon those officers who filled sufficiently high places in the government, and who held office at his pleasure. Under Jefferson the whole executive body was for the first time at harmony with itself. The Cabinet now had five members. For a period of seven administrations it maintained the status of an advisory body which expected to be called for consultation on all important questions, and at the same time had no power to enforce its views upon the chief executive. This was interrupted only by the disorders that resulted from weakness in the War and Navy Departments during the War of 1812. All the Presidents of this period succeeded to that office after being Secretary of State. Moreover, Madison, Monroe and John Quincy Adams retained in their Cabinets a number of their colleagues of the preceding administration. This stability was favorable to the Cabinet prestige. Jackson reduced the Cabinet to a more humble status. However, the popular idea of the "Kitchen Cabinet" is a mistake. During the period 1829–31 strained personal relations growing out of a scandal in the family of the Secretary of War made it almost impossible for the six heads of departments to meet together. The Postmaster-General was now included with the others. But it does not appear that the President was at this period guided by the counsels of the editors who had helped to elect and had received positions under the government. He was on most cordial relations with the Secretary of State and the Secretary of War. After the reconstruction of the Cabinet, councils were held regularly or at least frequently. In the matter of the removal of the deposits from the Bank of the United States, he acted contrary to the Cabinet opinion, and found his chief adviser in Amos Kendall, who is the most remarkable figure in the commonly accepted "Kitchen Cabinet." It might be expected that a great war would give to the Cabinet an increased importance. This was not the case in the War of 1812 or the Spanish War of 1898. The Cabinets of Madison and McKinley did not meet the extraordinary demand upon them with notable strength. But those of Polk and Lincoln profited by their opportunity. The period from Jackson to Polk was one of Cabinet debasement. That from Fillmore to Lincoln was one of Cabinet ascendency. The executive council now had seven members. It had also begun to meet at regular times. Pierce has been the only President who made no change among the heads of departments during four years. This has been pointed to by Southern writers as proof of great power to control men. But Pierce was led by his council. The Cabinet ascendency culminated under Buchanan. During the last months of his administration, the President was under the dictation of Black and Stanton, the Secretaries of State and War. The high position occupied by the Cabinet during the Civil War was not at the expense of the Presidential prerogatives. If Seward and Chase and Stanton were exercising extraordinary powers, Lincoln was doing the same. Indeed he consulted his advisers in the matter of the Emancipation Proclamation only after the document was already composed. The most momentous episode in Cabinet history is Johnson's attempt to remove Secretary Stanton from the War Department contrary to the Tenure of Office Act. This led to the impeachment of the President. Congress repealed the act early in the next administration, thereby acknowledging that it was an encroachment upon the President's rights. Since the reconstruction of the government, the status of the Cabinet has been on the whole as it was before the administration of Jackson. In Cleveland's first administration, the eighth member was added; and under Roosevelt, the ninth. The President's council bears the name of the great executive organ of the British government. But its functions are much inferior. The ministers who compose the British Cabinet are members of Parliament. They digest the great bills that are to be introduced, and direct their course in the House of Commons and the House of Lords. Their functions thus combine those of the standing committees of Congress with the direction of executive affairs. Under the American system the executive officers are rigorously excluded from the floors of Congress. The chief avenue through which the heads of departments can influence legislation is the standing committees. The question of admitting Cabinet members to the floors of

Congress for the purpose of giving information and of allowing them to participate in the debate of questions pertaining to their respective departments has been before Congress several times. See CABINET; KITCHEN CABINET; EXECUTIVE.

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15. THE ALIEN AND SEDITION LAWS. Alien and Sedition Laws, in the political history of the United States, were four laws passed by the Federalist party in Congress, June and July 1798, during President Adams' administration. These laws gave rise to the first nullification proceedings in the South, namely, the Kentucky Resolutions (q.v.), passed in November 1798, and the Virginia Resolutions (q.v.), passed in December 1798, and resulted in the final defeat of the Federalist party. The Federalists, who had controlled the government from its very inception, resented all hostile criticism of their conduct of national affairs and spurned the charge made by the Republicans that the Federalists were strongly inclined toward England and were trying to embroil the American nation in a war with France. Especially obnoxious to them were the embittered exiles who had been flocking to the shores of America from 1790. These exiles, who were French sympathizers, and, therefore, affiliated with the Republican party, attempted to create sentiment in favor of France, thus blocking the way of the Federalists, who desired to punish France for her outrageous attacks on American commerce and for her hostile attitude to the United States after the conclusion of the Jay Treaty. Moreover, by obtaining control of journals here and there throughout the country, or by establishing sheets of their own, they would publish scurrilous and offensive attacks upon the ruling party of Federalists, which the latter felt very keenly.

In 1797 the Federalists had a majority in the Senate, but the House was Republican. Therefore, the measures for defense against French aggression, which the Federalists attempted to pass, were all defeated by the Republican majority in the House. But the timely publication of the "X. Y. Z." correspondence (q.v.) showing the scandalous conduct of Talleyrand and the French Directory produced such an outburst of popular indignation against France throughout the entire country that the defenders of France were completely silenced, and even the moderates, who had sided with the Republicans, went immediately over to the support of the Federalists. The popular demonstration appeared to furnish a complete vindication of the course of the Federalists, who gained control of both houses and now were supreme. No sooner had they secured entire control of the reins of government than they began to carry out their party program of suppressing all hostile criticism of the Federal administration, even at the risk of stifling liberty and freedom of speech.

Accordingly, in 1798, the Federalists enacted three laws concerning aliens: (1) The new Naturalization Act, passed 18 June; (2) the Alien Acts, passed 25 June; (3) the Sedition Act, passed 6 July. The new Naturalization Act prolonged the requisite term of residence before naturalization from 5 to 14 years and the term after declaration of intentions from three to five years; denied alien enemies naturalization and required all white aliens to be registered on arrival, under penalty, and such registry to be the only proof admitted on application for naturalization. The Alien Act authorized the President, for the next two years, to order out of the country any aliens whom he thought dangerous or engaged in conspiracy. Any alien thus notified who should be found at large without the President's license might be imprisoned for three years and could never thereafter be admitted to citizenship. The Sedition Act empowered the President to arrest or deport all resident aliens when war was declared against the United States. As finally approved by the President, the first section of the Sedition Act made it a high misdemeanor, punishable by a fine of $5,000 and five years' imprisonment, for persons unlawfully to combine and conspire to oppose any measures of the government directed by proper authority or to interfere with the operation of any law of the United States or to intimidate any person from accepting or holding Federal office, or to commit, advise or attempt any insurrection, riot or unlawful assembly. The second section prescribed that the writing, printing or publishing of any false, scandalous and malicious writing against the government of the United States, or either house of Congress, or the President, with the intent to defame or bring any of them into contempt or disrepute, or to arouse against any of them the hatred of the good people of the United States or to stir up sedition within the United States, or to excite any unlawful combination for opposing or resisting any law or lawful executive act, should be punished, on conviction before the United States court having jurisdiction, by a fine not exceeding $2,000 and imprisonment not exceeding two years. The third section provided that the truth of the matter contained in the publication might be given in evidence as a good defense, the law and fact under the court's direction to be determined by the jury. A clause added by Bayard of Delaware limited the term of operation to 4 March 1801, so that it should expire with the Federalists if they should lose in the succeeding Presidential election and the Republicans should not have the credit of repealing it.

These acts were denounced by the Republicans as being in opposition to the constitutional rights of the States to permit such immigration as they chose, up to the year 1808 (specifically applicable to slaves), as assuming national powers over persons under the jurisdiction of their States and as violating the general right of trial by jury. On these points

the laws were attacked by the Kentucky and the Virginia resolutions, which Jefferson and Madison drew up, and which suggested nullification as the proper remedy.

The alien and sedition laws were obnoxious to the Republicans, not so much on the ground that they were inimical to civil liberty, but rather because they were regarded by that party as an encroachment upon the principle of States' rights. It is this aspect of the laws that gives them their chief interest and importance. The Alien Law, it is to be observed, was not enforced, nor would it have produced much disturbance among the Republicans if it had been strictly enforced. But the Sedition Act, which cut very near the root of civil liberty and was contrary to the underlying principle of American institutions, was enforced, since at least six prosecutions took place under it and Judge Chase invoked its authority for his scandalous partisan decisions. Upon the accession of the Republicans to power, these odious laws either expired by limitation or were repealed.

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16. THE JUDICIARY. Origin and Development. (a) *State Courts.*— While our American judicial system, like so many of our institutions, was modeled after that of England and was permeated by the principles and traditions of the English law, it is also true that for practical purposes it dates not so much from the American Colonial Period as from the years of readjustment following the Revolution. The necessity under which most of the States were placed by the separation from England of adjusting their governmental institutions to meet the demands of an independent existence afforded an opportunity for working out changes in their judicial systems which could not under any circumstances have been long postponed. Colonial administration of justice had been marked by serious defects. The judicial function was shared by executive and even legislative officials. The courts were, in the main, manned by untrained magistrates who dispensed justice according to their notions of common sense and fair play rather than according to established and uniform rules of law. The State courts which came gradually to replace this archaic and inadequate system followed in general the model of the then existing English judiciary. In the first place, there were the justices of the peace and local inferior courts for petty cases. There were, secondly, superior courts having original jurisdiction in civil and criminal cases and organized on a scheme either of districts or circuits. In the third place, there were courts of last resort usually exercising nothing but appellate jurisdiction. Some States further complicated the machinery of justice by setting up intermediate appellate courts occupying a place between the second and third groups just referred to. This general arrangement of courts still forms the backbone of our State judicial organization.

(b) *Federal Courts.*— Experience under the Articles of Confederation demonstrated the necessity of a separate system of Federal courts. The attempt to rely upon State tribunals, supplemented by the feeble efforts of a judicial committee of the Congress, failed miserably. The framers of the Constitution recognized that there must be national courts to deal with at least three important groups of cases: first, disputes arising between the States of the Union; second, disputes arising from the relations of the national government to foreign nations, such as matters covered by treaties; and third, controversies over the meaning of the Constitution itself or the laws passed in pursuance of it. Since all these cases could if necessary be taken care of by one Federal tribunal, the framers of the Constitution contented themselves with providing for the organization of a Supreme Court of the United States and stipulating that such inferior courts should be created "as Congress may from time to time ordain and establish." Not merely the details but the broad outlines of the judicial organization of the United States are accordingly to be sought in the acts of Congress rather than in the clauses of the Federal Constitution. The first Congress of the United States enacted the famous Judiciary Act of 1789, organizing the Supreme Court, establishing a system of inferior courts and marking out the jurisdiction of each. With some amendments this act formed the basis of the entire system of Federal courts until it was replaced by a revised Judiciary Act in 1911.

Federal Judicial Organization.—At the present time the judicial system of the United States comprises three grades of courts for the transaction of ordinary judicial business and two special courts: (1) The District Courts, 80 in number, form the lowest grade of Federal tribunals. They try civil and criminal cases and have original jurisdiction only. They are the only Federal courts in which a jury is used. Each district has a Federal district attorney and marshal to facilitate the work of the court and enforce its decrees. The jurisdiction of the District Court attaches in two types of cases. The first is the group of cases involving the interpretation or application of the laws, treaties or Constitution of the United States, cases which are referred to as involving a "Federal" question. The second kind of case is that in which the legal rights of citizens of different States are involved. Here the basis of jurisdiction is "diversity of citizenship." The District Courts hear cases both in law and equity following the rules of procedure suitable to each. (2) The intermediate Federal courts are the nine Circuit Courts of Appeal created in 1891 to relieve the Supreme Court of some of its burden. These courts, sitting both in law and equity, hear appeals from the District Courts and in certain cases not involving the constitutionality of laws have final jurisdiction. In cases raising constitutional questions, appeal of course lies to the Supreme Court. Prior to 1911 a group of courts known as Circuit Courts stood between the District Courts and the Circuit Courts of Appeal, but in that year they were

abolished and their work given to the District Courts. (3) The Supreme Court of the United States is the court of last resort on all questions brought up on appeal from lower Federal courts and in all cases removed from the State courts for a determination of the meaning or application of the treaties, statutes or Constitution of the United States. It has original jurisdiction in all cases involving ambassadors and public ministers of a foreign government and those to which a State is a party. The court consists of a chief justice and eight associate justices and a majority of the court is necessary to decide a case. (4) In addition to the courts of general jurisdiction just described, there are two special Federal courts. One of these is the Court of Claims which has jurisdiction in all cases involving claims of a contractual nature against the Federal government. The Court of Claims has no power, however, to give effect to its own judgments. Successful litigants before it are obliged to look to Congress for appropriations to satisfy the awards made. The other special Federal court is the Court of Customs Appeal which, as its name indicates, hears appeals upon all questions relating to the administration of the tariff laws. Its jurisdiction in these matters is final.

While in the main the State and Federal courts operate each group in its own sphere and deal with the questions arising under the constitution and laws of the government of which it is a part there is, as has been intimated, some overlapping of functions and jurisdiction. In the first place, any State court not even excepting the justice of the peace is authorized and may be called upon to render a decision upon a question involving the construction of the Constitution, laws or treaties of the United States. The power of the State courts to deal with these Federal questions need not be regarded as final, however, and an appeal lies to the United States Supreme Court itself. In the second place, in cases in which its jurisdiction rests upon diversity of citizenship, a court of the United States will frequently be called upon to construe and apply the provisions of State statutes or constitutions. In all such cases the Federal courts are bound to follow the construction which may have been placed upon such statutes or constitutional provisions by the highest tribunal of the State.

Selection, Compensation and Tenure of Judges.— The judges of the United States courts of all grades are appointed by the President with the advice and consent of the Senate. They hold office during life or good behavior and can be removed from office only by impeachment. The chief justice of the Supreme Court receives a salary of $15,000 and the eight associates $14,500. Congress is forbidden by the Constitution to diminish the salary of any United States judge during his term of office.

The method of choosing State judges varies as might be expected in different States. Three general methods prevail. The first is election by the people. A large majority of the States use this method although it did not become popular until the era of Jacksonian democracy. A second method is appointment by the governor usually with the consent of the State senate. This method of choice was once very common but has lost ground throughout the States except in the East. The third way of choosing judges is by the legislature. This method was common in the early State constitutions, but is now found in but four States, all of the older group. The relative merits of the choice of judges by popular election and by appointment by the governor are hotly debated. In behalf of popular election it is argued, first, that it is the only democratic method and is necessary to prevent judges from becoming autocratic and irresponsible; second, the people know as much and usually more about the qualifications of judicial candidates than do the governors who must rely on the advice of party leaders; third, the courts in passing upon the constitutionality of laws exercise a function which is not wholly free from political aspects and which should, therefore, be performed under the scrutiny and ultimate control of the people; fourth, the alleged evils of popular election of judges may in the main be eliminated by making judicial elections strictly non-partisan in form and procedure; finally, the choice of judges by the people has worked well in practice while many poor appointments have been made by State governors. The popular election of judges is attacked on the following grounds: First, the people have neither the knowledge nor the interest necessary to pass upon the qualifications of judicial candidates. Second, since this is true there can be no real popular choice of judges and what is called popular election is really the popular ratification of appointments to judicial positions made by irresponsible party leaders. Third, the qualities which make a good candidate in an election are not the qualities which make a good judge. This means that the best men frequently fail of election while the unfit may succeed. Fourth, the sense of security and independence which a judge must enjoy if he is to administer justice fearlessly and impartially is too often destroyed by the realization that decisions which are unpopular even though sound may jeopardize his re-election. Finally, the experience of the Federal courts as well as of the State courts which are chosen by the governor show that in practice the method of appointment obviates the evils mentioned above and results in the choice of men of the highest ability and integrity. It may be observed that the bar of the country is fairly unanimous in its opposition to the election of judges.

The term of office of State judges ranges from life or good behavior to a few years. Life tenure was originally the rule but has now become the exception since the principles and arguments justifying the popular election of judges also justify the practice of allowing the people an opportunity to retire them from office at the end of a fixed term of years. It is customary to choose the judges of the higher courts for longer terms than those of the lower courts.

There are three general methods by which State judges may be removed from office. The first and most common is the process of impeachment by the legislature. This method is available in every State except Oregon. The second is by address of the two houses of the legislature to the governor asking for the removal. In such a case the judge in question is usually allowed some kind of hearing before

either a committee of the legislature or the governor. The governor is not bound to remove a judge even though asked in this manner to do so. This is not a common method of removal. The third method of removal is by recall by the people. There are five States (1919) in which judges may be recalled. Some States which permit the recall of executive officers have not extended it to the courts. Bitter controversy has arisen over the propriety of subjecting judges to the recall. It is urged in defense of the scheme that judges are, after all, merely servants of the people and that it is simply a natural and logical application of the principles of true popular government to make the judges feel their responsibility to the people by giving the people an effective means of enforcing that responsibility. More conservative students of public affairs and especially the bar view the recall of judges with alarm. They argue that it will destroy the independence of the bench by exposing judges to the condemnation of the public for any unpopular decision they may render, no matter how firmly justified that decision may be by law. Thus the courts would cease to serve as bulwarks for the protection of individual liberty against the onslaughts of the majority.

Brief mention may be made of a plan for the selection and retirement of judges which has been worked out by some distinguished members of the legal profession and is being promoted by the American Judicature Society. This plan provides for the election by the people for a short term of a chief justice who is to perform not merely judicial duties but also administrative duties in directing the work of the entire judicial organization. This chief justice is to appoint all the other judges for a term of three years. After a judge so appointed has served three years the question is presented to the voters "Shall Judge ——— be retired?" This is a non-competitive recall election since no candidate opposes the sitting judge as would be the case under the ordinary recall. If the people vote to recall the judge his successor is appointed by the chief justice. If he is not recalled he continues in office for six years when he is again subjected to a non-competitive recall election. If again retained in office he continues for nine years when the same process is repeated. If popular confidence is again expressed in him he then holds office for life. It is felt that this plan affords the proper degree of popular control over the judicial department of the government without destroying the independence of the courts by making them the playthings of popular passion or partisan machinations.

Power to Declare Laws Unconstitutional. — The power exercised by the American courts of holding unconstitutional and void acts of the legislature which are, in their judgment, in conflict with the constitution, State or Federal, is a power as unique as it is important. In no other important country in the world do the courts perform this function. Furthermore, it is not a power which the national Constitution or any of the early State constitutions expressly conferred upon the courts. It was exercised in a few isolated State cases just after the Revolution, but it may be said to find its firm foundation as a principle of American constitutional law in the classic opinion of Chief Justice Marshall in 1803 in the case of Marbury vs. Madison. It was there pointed out that our written constitution is a limitation upon legislative power. As such it becomes worthless if the legislature is left free to violate it with impunity. Some authority must, therefore, exist to enforce the constitutional limitations. This authority is most appropriately confided to the courts. They are charged with the duty of determining what the law is in order that they may apply that law in the adjudication of the rights of parties in litigation. When the constitution and a legislative enactment are in conflict this duty of determining what the law is involves the duty of enforcing the constitution, which is the supreme law of the land, and of ignoring or nullifying the law. In so doing the courts are merely recognizing the obligation of the oath of office by which they bind themselves to uphold the Constitution of the United States. While the foregoing reasoning has not entirely escaped criticism it has seemed on the whole convincing and more than a century of acquiescence in the exercise of the power has relegated the question whether the courts were in the first instance justified in exercising it to the realm of academic and historical controversy. Not a few of the State constitutions now provide expressly for the judicial decision of questions of constitutionality and there is no State in which the courts do not exercise that power.

In exercising the power of deciding the constitutionality of statutes, the courts have imposed upon themselves certain restrictions. The more important of these may be enumerated as follows: First, the court will exercise the power only in actual litigation between parties whose material interests are involved. This means that unless required by the constitution to do so, as is the case in some half dozen States, the courts will not render advance or advisory opinions. Second, laws will not be declared invalid merely because judges regard them as unreasonable, inexpedient, unjust, or contrary to the "spirit of the constitution." Third, questions of constitutionality will not be decided unless their decision is necessary to a determination of the case before the court. Fourth, courts will not concern themselves with the legislative motives lying back of the enactment of a law in determining the validity of the law. Fifth, courts will not use the power of judicial review in regard to political questions, questions which the courts regard as confided to the discretion of a co-ordinate branch of the government. Sixth, every statute is presumed to be constitutional and any reasonable doubt upon that question is to be resolved in favor of its validity. Adherence to these general principles has had a useful effect in preventing the abuse by the courts of their power to invalidate laws. It may be safely asserted that, in spite of some questionable decisions, the exercise of this power by the courts has been wholesome and beneficent and constitutes in the minds of many the most valuable American contribution to political science.

Criticisms of Courts and Proposed Reforms. — In recent years the State and Federal administration of justice has been the subject of bitter attack, not only from laymen, but also

from the bench and the bar on the ground of its inefficiency. The evils which are universally admitted to exist are as follows: First, the administration of justice is entirely too slow. It is not uncommon for the highest court of a State to be two or three years behind in its work. It is not unusual for a case to be in the courts five or six years before final decision can be had. There are extreme cases in which 20 years or more have elapsed between the time a case was first placed upon the judicial docket and the time of ending the litigation. Second, most of these delays are wholly unnecessary and do not serve in any way the ends of justice. This is due to our cumbersome and highly technical scheme of judicial procedure. It has sometimes occurred that fully half of the cases decided by a State Supreme Court are cases which raise, not questions of substantive law, but questions of legal technicality. Third, as a result of the two evils just mentioned, justice, instead of being cheap and readily accessible to all, is too often placed beyond the reach of the poor man. Among the more important proposals which have been made looking toward a more efficient administration of justice, may be mentioned the following: (1) In the first place, it is urged that rules of procedure must be radically simplified and that this should be done, not by legislators who are unfamiliar in the main with the real problem in hand, but by the courts themselves. Where courts have been allowed to recast these rules the results have been good. A notable case of this is the recasting of the rules of equity procedure by the Supreme Court of the United States. (2) A second remedy is to restrict the right of litigants to appeal to those cases in which the ground of appeal is actually related to law and justice. Reversals and retrials on pure technicalities should be abolished. (3) There is a movement in the direction of modifying the power of the common law jury especially in civil actions, making the procedure in jury trials less cumbersome, and even dispensing with the service of a jury in many cases. There is need for a radical change in the method of selecting jurors for criminal trials, a process which frequently consumes weeks or even months under our present system. (4) In the fourth place, it has been proposed that the principle of division of labor be applied to judicial work and separate courts be organized to deal with particular kinds of litigation. In this way judges would acquire an experience in dealing with certain types of cases which would greatly add to the efficiency and expedition with which these cases could be handled. Some steps have been taken in this direction in various places by the organization of probate courts, juvenile courts, women's courts, domestic relations courts, traffic courts and the like. (5) A most thorough-going and comprehensive program of reform is sanctioned by the American Judicature Society and many prominent members of the bar. It calls for a radical change in judicial organization. It is proposed that the entire judiciary of a State constitute a single court. This court should be composed of three branches to deal with petty or local matters, with cases now coming up in the State courts of original jurisdiction, and with all appeals. Each of these divisions would be under the administrative supervision of a chief justice who would have authority to assign the individual judges to special types of judicial work, to transfer judges from courts which were idle to those whose dockets were crowded and to transfer cases from the wrong court to the right one without necessitating beginning the case over again. In these and other ways the efficiency of the courts could be enormously increased and the processes of litigation simplified. Such courts would, of course, have the power to make their own rules of practice. The Municipal Court of Chicago is organized to a very large extent along these lines and has proved an interesting and suggestive model to those interested in the reform of our judicial system.

With the thoughtful attention which is being given to these problems by men of the highest ability and with the ever-growing popular demand for some relief from evils of our present methods of administering justice, it is to be hoped and expected that progress in the direction of reform may be prompt and vigorous.

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17. DIPLOMACY. No complete history of the diplomacy of this country has ever been written. Much of its diplomatic effort has been spent upon private claims and national affairs, commercial rather than political. A history of these would be dull reading indeed. Moreover, it must be confessed that for long periods in our national life, our country played but an inconspicuous part in the world's politics, and upon such periods the historian must touch but lightly. To sketch the diplomacy of a century and a third, observing a proper sense of proportion; to trace the growth of policies, which have marched with the nation's growth; to characterize treaties which are the crystallized results of diplomacy; yet withal to keep within the narrow limits of a review such as this; such is the aim of this article. The treatment of the subject chosen is partly by periods and partly by topics, the latter where it is desirable to show the continuous growth of a policy or the history of a negotiation running over many years.

The French Alliance, 1778.— How to get military supplies and aid; how to win a standing among nations; these were the problems which the men of the Revolution had to face. The difficulties were tremendous. No foreign state was in political sympathy with the colonies. Recognition of their independence meant war with Great Britain. The only string to play upon was hostility to Great Britain. The only states likely to feel such hostility were Spain — on account of Gibraltar — and France, driven out of Canada by the English only 15 years before. Secret aid had been sent by France in 1776 and 1777 to keep the struggle alive, but open aid was dangerous, unless the colonies showed ability to hold their own. Thus the diplomatic situation waited upon the military one. The success at Saratoga was the turning point. Not in itself but in its consequences it was one of the great battles of the world. For after that the Comte de Vergennes threw off the mask, made treaties of commerce and alliance, thus recognizing the infant state, sent money and aid openly, and accepted the consequence — war with England. In all this Franklin was the influential factor. His fellow-commissioners, Deane and Lee, were inferior men. Their instructions from Congress were impossible, to seek recognition, commercial privileges and aid, without reciprocal military engagements. By departing from these, they secured a liberal commercial treaty and a military alliance, binding until the independence of the colonies was secured, peace to be made jointly with the common enemy. These treaties did very much to accomplish American independence. Spain, though in nominal alliance with France, actually gave but trifling help.

The Treaty of Peace, 1782.— There had been overtures and negotiations looking toward peace in 1778 and 1779, but not on the basis of a prior recognition of American independence which the colonies deemed essential. In 1781 various agents to foreign states were united as commissioners, with full power to treat with Great Britain. These were Franklin, Adams, H. Laurens and Jay. Of these Franklin alone had faith in the sincerity of the French government. A change in the British ministry in the spring of 1782, Lord North going out, made negotiation easier. The chief points at issue were: (1) The boundaries; (2) the Northern fisheries; (3) the confiscated estates of Loyalists. Spain intrigued with France against the Mississippi as our western boundary, desiring to confine the new state to the region east of the Alleghanies. But by the westward migration into the Ohio which was already in motion, this was made impossible. In the northeast the Penobscot and Saint John rivers had been urged as boundaries, and a compromise, the Saint Croix, adopted. New England regarded the enjoyment of the fisheries of the Gulf and Banks as essential to her prosperity. Against the covert opposition of France and the indifference of the South, she stoutly held out for large fishing liberties and got them. Full restoration of confiscated estates by the new government was a financial impossibility, was physically difficult, was negatived by the fortune of war. The utmost that Great Britain could wring from the Americans was a treaty provision that Congress should recommend to the States restitution and compensation to the purchaser for value. This was, and probably was intended to be, a nullity. But it was coupled with the welcome proviso that debts should be collectible and further confiscations stopped. This treaty was provisional, and made without Vergennes' knowledge (which was a violation of instructions), so great was the distrust of France by Adams and Jay. It was put into definitive shape the next year, 1783, with French consent and in compliance with Article VIII of the treaty alliance of 1778. This treaty of peace was a diplomatic triumph for the United States.

Attempts to Secure Recognition from Other Powers.— Although Spain was in alliance with France, the ally of the colonies, she added little weight to the coalition, was unfriendly and tricky, feared the result of American independence upon her own possessions and made no treaty with the United States until 1795. Tuscany and Austria also refused a treaty on the plan voted by Congress and accepted by France, as did Prussia, whose timid king, without a navy, saw no chance of maintaining intercourse should it be established. Congress was ready to accede to the principles of the armed neutrality of 1780, but was not permittted by Russia, its originator. The Netherlands joined this neutral league in spite of British threats. This, with the exposure of an incipient negotiation with the colonies, led England to declare war against her in 1780.

The Establishing of Commercial Relations.— This was of the first importance to the new state. Its foreign trade was then relatively more important than now. The French treaty was the only commercial treaty existing until the very close of the Revolution. Decentralization, under the Articles of Confederation, was a serious handicap in negotiating, for it weakened the trade privileges to be offered. After sturdy persistence, John Adams had secured a treaty in 1782, from The Netherlands, much on the lines of the treaty with France. Both of these treaties, in the freedom of neutral trade, in the regulation of search, in the definition of contraband and the opposition to privateering, were liberal, and show the influence of Franklin. He also shared in the negotiation of two other treaties of amity and commerce, with Sweden in 1783 and Prussia in 1785, both containing much the same features as the earlier ones, and displaying the same enlightened characteristics. Spain came into line in 1795, her treaty restraining our southern boundary also, and in 1799 the expired treaty with Prussia was revived with some changes, due to war time. Jay's Treaty with Great Britain in 1794 was very much more than a treaty of commerce. How it dodged and how it settled many outstanding difficulties will be seen presently. But as a commercial agreement, its unlikeness to the others enumerated must be recognized. For in it, England, the foremost maritime state, did *not* grant that free ships made free goods, did not like Prussia allow pre-emption of all contraband articles except provisions, but permitted trade without discrimination, admitted consuls and inserted the earliest of our extradition agreements. Upon the basis of these commercial treaties this country's foreign trade was

built up, and much of its prosperity was founded. This is too apt to be overlooked.

Treaties with the Barbary Powers 1787–1805.— This is a curious chapter in American diplomacy, but must necessarily be brief. Like every state trading along the Mediterranean, our own country was forced to pay tribute, to avoid the seizure of its ships and the enslavement of its citizens by the African corsairs. The alternative was to convoy our vessels, to put them under foreign protection or to establish immunity by successful war. The treaties with France 1778 (Art. VIII), and with The Netherlands 1782 (Art. XXIII), promised us the diplomatic aid of those countries against the Barbary powers, while both Portugal and Spain on occasion helped our crews. In 1784 Congress authorized direct negotiation, the commissioners being Adams, Franklin and Jefferson. Of these Jefferson preferred war, while Adams thought tribute the less expensive way. They tried to bring about concerted action with other states but failed. Then through an agent they dealt directly with Morocco in 1787. This treaty regulated commerce, forbade enslavement of prisoners and allowed partial consular jurisdiction. It promised no tribute but seems to have needed occasional liberal "presents" to be operative. In the next decade treaties were made with Algiers, 1795, carrying 12,000 sequins annually; Tripoli, 1796, with a lump sum of tribute agreed to (Art. X); Tunis, 1797, $107,000; the three costing us for their execution some $2,000,000. They contained some curious and some very modern provisions, but were alike in forbidding the enslavement of Americans. There were disputes, armed clashes, but nevertheless tribute, until Decatur wiped out the system and the shame in 1815.

Neutrality and Its Difficulties, 1793–1812. — Except for the Civil War, this was perhaps the most critical period in the history of the republic. Gratitude to France, the surviving bitterness toward England, many grievances left by the war and still unsettled, all these inclined the United States toward the French side in the Wars of the Directory. Such aid upon the sea might well be of vital importance. To secure it Genet was sent by France as minister. But he found Washington resolved upon neutrality as the only safe course. Maritime war with England would have destroyed our commerce and thrown our affairs into fatal confusion. Neutrality meant a breathing spell. Angered by this, Genet tried to compromise our performance of neutral duties in every way until withdrawn at the close of 1793. (See INTERNATIONAL LAW). Opposition to Washington's course, shared by Jefferson and his followers, gradually built up political parties. Besides old grievances against Great Britain, there were newer ones, which the war with France led to, impressment of seamen from our ships, for instance (see IMPRESSMENT), and the ruin of our trade with the Continent in breadstuffs, by an order making them contraband. A commercial treaty was also badly needed. In 1794 John Jay made the treaty which settled all these points, but only by leaving some of them out. It contained our first extradition agreement. It admitted us to the East and West Indian trade under conditions. It framed a list of contraband. But in it Great Britain did not renounce impressment. Jay's treaty was ratified in spite of a storm of abuse and opposition and helped American trade immensely in the years to come. Our relations with England and France were like buckets in a well. As friendship with one grew, with the other it waned. So now France began to seize vessels and property, under any or no pretext. When Pinckney went to Paris to remonstrate in 1796, he was rebuffed. Humiliating negotiation went on nevertheless, in 1797, three commisioners being sent instead of one. A national loan and individual bribes were demanded by Talleyrand as a condition of negotiation. It was then that the curious episode of the X. Y. Z. Correspondence (q.v.) occurred. Thus this mission was as fruitless as the other had been. Yet a third one was sent, by Adams, to the dismay of the Federalists and was lucky enough to profit by the revolution of 18 Brumaire 1799, which made Napoleon first consul. For now France contemplated a commercial league against England, and was ready to negotiate. The treaty of 1800 was the result. This did not pay for French spoliations (that was arranged in 1803), but relieved the United States of the various embarrassments of the 1778 treaties, while restating many of their provisions. This treaty was another valuable step forward. But after an interval of calm, impressment became again active, and various outrages were committed by British ships of war off our own coast. All this was dwarfed, however, by the extensive and illegal paper blockades (see INTERNATIONAL LAW) with which the combatants fought to the injury of the neutral. Our reply was an embargo (see EMBARGO), and useless negotiations with both countries. England's obstinacy and Napoleon's duplicity, coupled with the ardor of our own South, forced us into the ill-judged War of 1812. In spite of all the hampering restrictions of this period, our foreign trade increased largely. Neutrality as established by Washington meant national salvation.

Boundaries and Territorial Growth.— The diplomatic processes which have built up our present limits, out of a country bounded west by the Mississippi and void of Florida, are lengthy and important. But the barest outline can be given here. They consist of (1) boundary adjustment; (2) territorial acquisition; the two often mingled. The first stretch of line, the Saint Croix River, was in dispute as early as 1783, but definitely identified in 1798. The next piece was to run north to certain "highlands," which we placed near the Saint Lawrence, but Great Britain laid down across the heart of Maine. Much disturbance arose in this vast wild region, the scene in 1839 of what is known as the Aroostook War. In 1842 it was divided by the Ashburton Compromise, on the line of the Saint John River, the Saint Francis and a range of hills. From the source of the Connecticut to the Lake of the Woods, the differences have not been serious. West of the Lake of the Woods, after the Louisiana Purchase, the line ran along the 49th degree but halted at the Stony Mountains until 1846, when it was carried forward to the Gulf of Georgia, studded with islands. There are two ship channels through this archipelago, one of which (the Canal de Haro) after more long years of controversy was designated as the treaty channel, by the emperor of Germany, arbitrator, in 1873. This whole northern bound-

ary, from ocean to ocean, was relocated in 1908 by treaty. Meanwhile Alaska had been purchased from Russia in 1867, and here, too, were disputed boundaries. The Canadians desired a harbor on that coast, and interpreted the treaty so as to draw the line 10 leagues back from the coast, crossing some fjords, not going around their heads. But this was denied by the commission which decided the boundary in 1903. (See ALASKAN BOUNDARY COMMISSION). The Mexican boundary is partly an artificial, partly a riverine one. The Rio Grande is a shifting stream and the Arizona boundary marks have a way of disappearing, so that to this day occasional diplomatic adjustments of the line are necessary. The chief acquisitions of territory prior to 1899 have been by the purchase of Louisiana, 1803; of Florida, 1819; of Alaska, 1867, and by the annexation of that vast region southwest of Louisiana which the Mexican War brought. Each of these events should be studied under its own title. Of their diplomatic aspects but the slightest review can be given here. A long controversy with Spain over the free navigation of the Mississippi to the Gulf, with the right to transship, made it perfectly clear that our West would insist upon these privileges. French ownership of Louisiana, 1800, was far more dangerous than Spain's could be. The sale of Louisiana, 1803, though earnestly desired by the United States, was effected by Napoleon's naval and financial weakness and change of plans. (See LOUISIANA PURCHASE). Louisiana was a terribly ill-defined region and naturally capable of being stretched. In the far Northwest this process was aided by Gray's discovery of the Columbia, 1793; Lewis and Clark's exploration in 1804–05; Astor's trading-post at its mouth, 1810, and by the Spanish cession of rights on the Pacific (Art. III, treaty of 1819). But the rights so derived were vague at best; the title to the Oregon country was left by treaty for many years in abeyance, and that splendid region finally won by the influx of settlers. Spain, in Florida, for years kept the inevitable at bay with the sole weapon of delay. Finally, in 1819, upon the assumption of our citizens' claims against Spain, up to $5,000,000, the cession of Florida was agreed to. (See FLORIDA). The territory gained by the Mexican War was partly seized, partly paid for. That war was necessitated by the annexation of Texas, to which Mexico still laid claim and with which she was still at war. (See MEXICAN WAR). The Gadsden Treaty of 1853, by purchase, enlarged this territory.

The Monroe Doctrine and Its Development.— This policy was based on the right of self-defense. It has never given the United States rights not otherwise existent. With much of truth it has joined much of indefiniteness; to the genuine principle of self-defense it has joined this paradox, that the stronger the nation grew and the less it had to fear, so much the broader grew the doctrine in its application. Throughout the diplomacy of the past 80 years this doctrine runs like a thread. Toward Cuba and Hawaii, as well as toward South and central America, it was the determining factor in the national attitude. No native politician can live without accepting it; our foreign neighbors, at one time or another, have for the most part grudgingly submitted to it. Originally it announced three things: that no colonization on this continent by a foreign power would be suffered; that the United States would take no part in European politics; that European intervention, to control the form of government of an American State against its will, would not be tolerated, because it was dangerous to our peace and safety. The first principle was aimed at Russia; the last at the Holy Alliance. This Monroe Doctrine was enforced on its original lines as late as 1865, against French intervention in Mexico. (See MEXICO). In and out of Congress it was deemed applicable in a broader way, to limit French control of De Lessep's Panama Canal, in the period subsequent to 1880. With a scope still further enlarged, it was used by President Cleveland in 1895, to curb Great Britain in her boundary dispute with Venezuela. And now it is within bounds to say that the old policy tends to become a new one, "America for Americans," the freedom of this continent from European sovereignty and control. As an evidence of this tendency may be cited Convention 2, signed at The Hague 1907, which forbids the use of force for the recovery of contract debts between states until arbitration has been tried. To many of the American states even this seemed to fall short, they wishing force never to be legalized for the recovery of debts, public or private. See MONROE DOCTRINE.

Relations with Spanish-American States. — Our diplomacy in this direction has been concerned mainly with such matters as (1) protection from foreign aggression, as of Venezuela from her creditors, in 1903; (2) pressing private claims; (3) exercising an indefinite kind of police power to keep order; (4) trying to bring about unity of feeling and action in various directions, as in the Pan-American and earlier congresses. This sense of a common interest and desire for unity of action have grown markedly in the past 10 years. The various factors which complicate the situation are chronic revolutions, lack of security to the persons and property of foreigners resulting, defaulted national debts, redress claimed by other powers, jealousy of the United States, lack of consideration and of understanding on the part of the United States, a theoretical but not very active republican tie of sympathy. The natural desire of foreign powers is to collect debts or secure redress by force, and if this is prevented by the United States, to make this country responsible. Our problem is to exercise the control which our position on the continent demands, with no assumption of responsibility for the acts of our neighbors. Somewhere between these positions there must be a line drawn; to find it requires a nice diplomacy.

The Slave Trade and the Right of Search. — For nearly 70 years the right of search was a burning question with England in one form or another. The key to the difficulty was the painful recollection of British impressment practice. That was an attempt to enforce a municipal law on a foreign ship on the high seas, that is, within another state's jurisdiction. It was not formally surrendered; it was disused. Early in the 19th century began the anti-slave trade agitation in England, perhaps a unique example of national altruism. To be made effective this

movement needed a universal right of search on suspicion of slave trading, to be exercised by the war ships of one or more states. By treaty with several powers, Great Britain gained this right, but in the case of the United States the memory of impressment made this later exercise of search too unpalatable. Hence, of course, slavers would try to screen themselves by a false use of our flag. To meet this Great Britain set up two new theories. One was, 1810, that since American statutes forbade our citizens to trade in slaves, English ships and courts might enforce this prohibition — an absurdity. The other, about 1840, claimed a right of visit (of a foreign ship at sea in time of peace) as distinct from a right of search, which was denied by Mr. Webster and surrendered by Lord Aberdeen in 1859, after years of exasperating controversy. (See INTERNATIONAL LAW). In 1842, by treaty, the two powers agreed to maintain separate squadrons for slave trade prevention, acting in concert when feasible; in 1862, the reciprocal right of search was at last conceded to ships specially authorized. To stamp out the slave trade on land and on sea, as relates to Africa, many states, the United States amongst them, united in the act of 1892, but here too a reciprocal right of search existed only when otherwise granted by treaty.

Fisheries and Sealing.— Here we touch the question of a state's jurisdiction over the high seas and its coast sea. The treatment of the Northern fisheries was a problem in the peace of 1783; it is a problem to-day. In 1783 the high sea fishery was admitted to be open to the new state, while an extensive grant of coast fishing privileges off Newfoundland, Labrador, Nova Scotia and the Magdalen Islands was added. As a grant, this privilege was terminated by the War of 1812, according to British contention. By consenting in 1818 to the revival of but a portion of the coast fishery formerly enjoyed, the United States accepted this theory. The grant of 1818 was in terms perpetual. Between this treaty and the next, in 1854, much had happened in fishery matters to disturb the peace of the two countries; adverse provincial legislation; the broadening of forbidden waters by the headland theory; exclusion from the large bays under penalty of capture; and on the other side, smuggling and aggression by our own smacks. In 1854 came in the principle of reciprocity, which really meant free fishing to us, free entry of fish to the Canadians, which they strongly desired. In 1871, this reciprocity, which had terminated, was revived for a term of years, coupled with an arbitration plan for striking a balance of values. Under this the Halifax Commission, 1877, decided $5,500,000 to be due Great Britain. Now we are back on the 1818 basis again, defined as to Newfoundland, by the arbitration of 1910, but we still need the Gulf fishing and the Canadians need our market. Since these are, the one of fluctuating, the other of great and certain value, it seems false reciprocity to try any longer to balance them. In the Pribilof seal herd, acquired by the Alaska purchase, the United States had a valuable asset. These seals spend part of their year at sea, but returning to their isles to breed are exposed to pelagic attack. The United States has tried to prevent this wasteful method of gathering skins by claiming exclusive jurisdiction over the eastern Bering Sea, and by claiming ownership in the seals while at sea. When these claims were tested by arbitration at Paris in 1893, they both broke down (see BERING SEA CONTROVERSY), but it had been agreed whatever their respective rights might prove to be, that sealing regulations should be enforced by the two powers for the preservation of the seal herd. Such were framed, but have proved ineffective. The best way of treating the question from the first would have been by international union, to include Russia and Japan. Mr. Bayard tried this, but Canada's influence prevented and later Mr. Blaine tried the other, mistaken, tack. In 1897 our own country, Japan and Russia agreed to prohibit pelagic sealing, so long as experts deemed essential, and finally in 1911 Great Britain acceded, so that until 1926 all pelagic sealing in the north Pacific is prohibited, the catch on the Pribilofs being equitably shared.

As to Interoceanic Canals.—The diplomacy of the United States has been long and often concerned with the attempt to secure a favorable canal concession across some portion of Central America, and to define such canal's status. It has been seriously handicapped, however, by two things: (1) In constant uncertainty as to what route was physically best, it has had to negotiate, so to speak, in the dark, with several states, any one of which might be the sovereign of the route decided upon. (2) Our policy has alternated between the neutralization of a canal by the commercial powers, as in the case of Suez, 1888, and single-handed control and protection by the United States, the latter predominating. The victory of the latter policy was made clear by the defeat of the first Hay-Pauncefote Treaty in the Senate. The convincing argument for it was the desire for an exclusive war right in the canal, for naval mobilization. This was rendered possible by the abrogation in 1901 of the Clayton-Bulwer Treaty (q.v.) of 1850 with Great Britain. The revolution in Panama and its recognition as an independent state in 1903, followed by a canal treaty with the new state, by which the United States guarantees Panama's continued independent existence, are the final steps in this long process of negotiation and definition. Under these two treaties with Great Britain in 1901 (the second Hay-Pauncefote) and the treaty of 1903 with Panama, the great canal has been dug, the process requiring 10 years from possession in 1904 to opening in 1914. Its status is that of territorial ownership, by perpetual grant from Panama, the rights of the French Company being extinguished by the payment of $40,000,000 and with a douceur to Panama of $10,000,000 and $250,000 a year. The territory is a zone 10 miles wide, with water rights beyond this limit; Colonel Goethals was the engineering and administrative head; Colonel Gorgas was in charge of sanitation; it was theoretically neutralized but by the United States alone, which really means protected; to make this protection effective the terminals have been fortified; it is governed by an appointee of the President; it is opened on terms of equality to the ships of all nations. See PANAMA CANAL.

The United States and the Declaration of Paris.— Why has the United States, always standing up for neutral rights, never joined in the neutral bill of rights of 1856, called the

Declaration of Paris (q.v.)? It was the abolition of privateering which was Mr. Marcy's stumbling block in 1856, because he deemed the retention of this right necessary to supplement our small navy. But, he said, if you will yield the right to capture enemy's innocent private property at sea as well, our accession will be gladly made. Spain and Mexico likewise refused. Yet when Spain and the United States were at war in 1898, neither side employed privateers. It can be shown that the other rules of the Declaration are in the interest of the United States and accepted by it; also that privateering is not of much practical value to-day, particularly to a naval power. The conclusion should be drawn that in this respect our diplomacy has been a mistake, that we should gain much and lose little by accepting the Declaration of Paris in its entirety.

The Diplomacy of the Civil War.— This was mainly concerned with three classes of questions: (1) those relating to the recognition of Southern belligerency; (2) those relating to the blockade; (3) those connected with the equipment and reception of Confederate ships of war in foreign, mostly British, waters. In the first particular Mr. Seward pursued a wrong-headed policy, claiming the rights of a belligerent to blockade and search, for example, which implied a legal war, but denying nevertheless the existence of a war and of a body of neutral powers. This mistake complicated much of the early diplomacy of the war, and made the attitude of the North most difficult. When states find their relations closely affected by a civil war, their commerce hampered by the rules of blockade, contraband and search, a new flag seeking entrance to their ports, a new government *de facto* applying belligerent rights on the sea, they are warranted by international law and by their own commercial interests, in recognizing the new belligerent and declaring their own neutrality. In our Civil War, Spain, The Netherlands, Great Britain and France did this, and Mr. Seward complained of it. The blockade of Southern ports was a gigantic task, slowly made effective, with some irregularities, but in the main conducted on legal lines. Great Britain, the power whose trade was most affected by it, respected it and was even considerate in declining to press remonstrance in view of lapses in the blockade of certain ports, and in cases where the declaration of blockade for a long period was not substantiated in fact. It was in the partiality with which England's neutrality laws were administered at her colonial ports, and particularly in the violation of those laws in home waters, that she erred. Two Confederate cruisers were built, equipped, armed and in some degree manned by British agencies. They helped to sweep Northern commerce from the seas. Mr. Adams and the watchful consuls resident in England left no stone unturned to stop them. Never was there a more difficult position than that of C. F. Adams, nor one more gallantly filled. Sympathy for the South pervaded the ruling class. The gradual change of sentiment as the war progressed, the consciousness of a dangerous precedent set, the diplomatic pressure applied after the war by a reunited United States, these led Great Britain on to the settlement of the so-called Alabama claims at Washington in 1871. This was a diplomatic triumph, because it laid down a strict standard of neutral behavior, by which England consented tnat a court of arbitration should judge her conduct, though denying that it had been theretofore applicable. See INTERNATIONAL CLAIMS AND DISPUTES.

Naturalization Questions.— The allegiance of individuals is transferred by emigration followed by naturalization. But if the laws of two countries prescribing the conditions ot these processes are not identical, since the new allegiance involves protection, upon the return of the individual to his country of origin a legal conflict as to his allegiance may occur. So, too, if his emigration has been unpermitted, or has evaded military service. Owing to the copious immigration which has sought the United States, our diplomacy has been largely concerned with just such cases. Our diplomatic remedy was to seek as a favor for the individual relief from the obligation or service still due which the naturalized German-American, for instance, visiting his mother-country, was held liable for. Some such had served in the Civil War, some had emigrated as mere boys. The law was clear, for a state may lay down its own conditions of emigration. Between 1865 and 1870 the situation became acute and a remedy was eagerly sought. Another class of difficulties arose where our laws naturalized emigrants of states like England, which held the allegiance of their subjects to be indelible. Here both countries had claims to the service of the same person. By the negotiation of treaties with the North German Union, 1868; Belgium, 1868; Hesse, Bavaria, Baden and Württemberg, 1868-69; Mexico, 1868; Sweden and Norway, 1869; Austria and Great Britain, 1870; Denmark, in 1872, these difficulties were cured. By these treaties, the right of expatriation was allowed and our five years' residence requirement was recognized. (See NATURALIZATION). The provisions of these treaties were reciprocal. Two withheld their privileges from youth who ran away when actually drawn for military service. The others made no such distinction. The subsequent working of these treaties has not been altogether without friction. It may be noted that the modern tendency is toward a uniform five years' residence rule for naturalization, as under the new Cuban Constitution. These naturalization treaties were a very considerable diplomatic achievement, due largely to our Minister resident at Berlin, George Bancroft.

The Diplomacy of the United States in the Orient.— This has reflected commercial rather than political demands. Owing to the radical differences in law, in usage, in racial feeling, European intercourse with the East has insisted for its protection upon a fixed treaty tariff upon imports and upon that exemption from the local law and jurisdiction which we call exterritoriality. This was a limitation upon the sovereignty of Oriental states. On the other hand, only certain ports in China and Japan were opened to foreign trade. These various features appear in our treaties with China, 1844, 1858, and with Japan, 1854, 1857, 1858. Between 1860 and 1880 both countries began to absorb the new civilization, Japan eagerly and China, vaster and not so centralized, without enthusiasm. Here was the parting of

the ways. China thereafter allowed religious freedom, submitted to our drastic immigration restrictions, 1880 and 1894, but otherwise dealt with the United States on the old conservative basis. Japan meanwhile abolished feudalism in 1871; set up a representative Parliament, 1881, 1890; adopted a code of law framed on an European model and made rapid progress in the new ways. Her victory over China in 1895 gave her a position which compelled the powers to surrender their special privileges, as to duties and jurisdiction. In this our own country had prior to the war taken the initiative. A considerable influx of Chinese work people, intense local prejudice against them in the West, some deadly riots in which they have suffered and on the other hand outrages to missionaries and the Boxer attack on the legations in Peking have proved some mutual ill-will, while in the main the respective governments have been on friendly terms. More important still was the war with Russia, 1904, ended by the Peace of Portsmouth, both Japanese triumphs of arms and diplomacy.

As a result Korea become a Japanese protectorate; the control of Manchuria was shared with Russia and China; Japan's influence upon China increased; her position in the entire Pacific was enhanced; she became truly one of the great powers. As a result also a certain degree of friction has developed with the United States, owing to the hostile legislation of our Pacific States rather than to any Japanese act, it is true, but with a consciousness of conflicting interests. China during the last decade has tended toward modern ways. She has encouraged railways and internal development; has driven out the Manchu dynasty; has assumed a republican form of government and a constitution; all without serious bloodshed. Under the policy of the Open Door and the Golden Rule, we have watched these changes hopefully yet realizing that the new republic has neither the political unity nor the military strength to make its future certain. See JAPAN; CHINA; SIAM.

Cuba and the Spanish War.— The relations of the United States with Cuba have been impressed with a sense of the latter's geographical importance, jealousy of its control by any other state than Spain and a desire for undisturbed trade and settled government. To Cuba, Monroe's declaration of policy has applied with peculiar force. The slave interest before 1860 at one time dreaded a free Cuba, at another desired its annexation. Purchase was several times offered, as in 1847, and in 1854 under the foolish threat of the Ostend manifesto (see OSTEND MANIFESTO), but Spain declined. During the Civil War, Spain showed some sympathy for the South, although it was Southern influence that had coveted the island. The liberal revolution of 1868 in Spain was reflected in Cuba, but there cruelly put down. There ensued a disturbed decade when our neutrality was enforced in spite of aroused sympathy, some filibustering, and an offer of mediation, 1869. Cuban belligerency was not recognized, though Grant came within an ace of such action. In 1878 the rebellion collapsed, in 1894 it broke out again. In the interval had come illusory reforms, better trade under reciprocity with the United States and steady misgovernment. We were nearly affected by the new insurrection, in damage to trade and the burden of preventing filibustering. Yet what remedy was there? Recognition of Cuban independence was out of the question, since independence as a fact did not exist. Recognition of Cuban belligerency was inconsistent with our usage and would have hurt our trade still more, while releasing Spain from all further responsibility for losses in Cuba. There remained inaction or intervention. The hand of the administration was forced early in 1898 by the destruction of the warship *Maine* in Havana Harbor, attributed by many to Spanish agencies, though a court of inquiry fixed no responsibility. War resulted. The chief points at issue before the peace commissioners at Paris were the assumption of the Cuban debt by Spain and the disposition of the Philippines. After a struggle and the payment of a solatium, Cuba was set free without being saddled with the cost of her ravaging, and the Philippines were ceded to the United States. So strong was the opposition to this last, as an act of domestic policy, that the Senate barely ratified the treaty. But as it has turned out our retention of the Philippines has been a test of character applied to this country which it has successfully met. For by reforming the land system of the islands, by giving them modern education, by developing communications and enforcing order, by training in self-government, in short by sacrificing our own interests rather than squeezing for our own profit, we have lived up to the best ideals of colonial government.

The Great War and Our Neutrality.— The European War, which began in August 1914, affected deeply the whole civilized world. But so large a part of that world was belligerent as to make the neutral fraction relatively powerless. The only weapons possessed by the United States were against Germany, the seizure of some $100,000,000 of merchant shipping lying up in our ports; against England, an embargo of munitions and food stuffs. The first meant a break, perhaps a war, with Germany; the second meant a commercial panic. Our position, therefore, when it became apparent that both belligerents were bent upon infringing our rights as neutrals, was extremely difficult. We complained of German mine laying in the open sea, of her brutally illegal submarine methods, illustrated in the *Lusitania*, of her plots to prevent our trade in contraband which even attempted the destruction of our factories and ships; we complained likewise of the British methods of blockade, their definition of contraband, their extraction of noxious persons from neutral ships on the high seas, their seizure of mails and exasperating delay in remedial process.

Moreover, although probably three-quarters of our people warmly sympathized with the Entente allies, the German minority party tried in every way to hinder and to discredit the administration. Such evidences of divided allegiance shocked the country so that in the Presidential campaign of 1916, all platforms denounced it.

During the war President Wilson offered mediation without avail, and various individuals agitated to bring about peace. They did not

realize that mighty, fundamental differences between the combatants were being fought out, a terrible but necessary process before the world could return to peace. The United States performed its neutral duties faithfully for its trade in contraband, which was naturally objectionable to the Germans who got none of it, was absolutely legal and proper. Its long suffering in merely protesting against the invasion of its neutral rights, was due to the causes stated above. But as the war went on, the country became acutely conscious of its military weakness, and increases in both military and naval establishments were voted by Congress.

Relations with Mexico.— President Diaz ably built up commerce and transportation in Mexico and fulfilled its foreign obligations, but he failed to satisfy the demands of his people for education, a change of the land system, and administrative reform. His supplanter, Madero, was too feeble to solve either foreign or internal problems; while Huerta had no chance, for President Wilson, displeased at the bloody beginning of his rule, refused to recognize him. Moreover, his rival, Carranza, was helped with arms and money to drive Huerta out and was recognized in turn. During all this upheaval the country fell into chaos, brigandage became rife, our own border had to be guarded, and on a somewhat trivial point of etiquette Vera Cruz was occupied, and later abandoned.

Carranza proved unequal to his task. He had no credit; he could not maintain order; his soldiery was insubordinate; the national debt was defaulted and the country starved. Then came raids over the border, quite purposeless but most exasperating, led by Villa and others. To punish and prevent such raids, United States troops were sent southward hoping for a co-operation in bringing about order, which they failed to get. Instead they twice met with open resistance from the Carranzistas.

The United States and Arbitration.— This account of the diplomacy of the United States would be incomplete without some reference to its attitude toward arbitration as a means of settling international differences. This has been a lifelong policy. It was used by the provisions of Jay's treaty in 1794, to designate the Saint Croix boundary; in 1814 to apportion the islands in Passamaquody Bay; in 1814 also to settle the northeastern boundary. By this device the Alabama claims, the San Juan boundary, the Northeastern Fishery dispute, the sealing controversy, all these being differences with Great Britain, have been satisfactorily arranged. The Alaskan boundary was laid down by a joint commission which is not strictly an arbitral method but a substitute for it. All of this has been narrated. These were all instances of special arbitration, i.e., of reference to a special court agreed upon ad hoc. Their fortunate outcome naturally led to a desire to broaden the usage, to make it general, perhaps obligatory, instead of particular. Both of The Hague conferences testify to the efforts of our delegates to this end. But besides this, our State Department has tried in at least three different ways to generalize the arbitral principle by treaty.

(1) In 1908–11 Mr. Root made nearly 20 treaties which refer to The Hague Court questions "of a legal nature or relating to the interpretation of treaties" provided they do not affect vital interests, independence, or honor. A vast number of similar agreements were made by other powers, their scope being equally limited.

(2) In 1911 Mr. Taft framed treaties, with both France and Great Britain, referring to arbitration all questions in dispute justiciable in their nature, to which was coupled a Commission of Inquiry provision. These failed of ratification in any useful form.

(3) In 1913–14 Mr. Bryan carried through some 30 treaties based on a so-called Peace Plan which by the certain reference of all matters in dispute to a commission of inquiry, war and increase of armament to await its report, gave opportunity for calm deliberation.

At The Hague and elsewhere, Germany stood in the way of all arbitral proposals which meant anything, preferring the arbitrament of force; thus the two countries, Imperial Germany and the United States, in a sense might be regarded as the champions of the two systems of force and arbitration for the settlement of differences and their military power has corresponded.

Modern Diplomacy and General Characteristics.— Other topics with which our diplomacy has had to do might be detailed. Extradition, copyrights and trademarks, free navigation of rivers, Samoan affairs, tariff by treaty, and so on; but these are more conveniently discussed elsewhere. American diplomacy to-day still shrinks from an active part in European politics. This was explicitly stated to The Hague Conference in 1899. With this in mind it is a question if the United States can properly be called a world power. But in point of fact, our interests and our diplomacy have been more impressed by those of Europe than we may think. Our share in international legislation relating to the care of the wounded, industrial property, the slave trade, submarine cables, exchange of official documents, are examples, and particularly since the Spanish War has this been true. One detects in our recent diplomacy a more confident tone, a readier initiative, even the air of leadership, coupled with ingenuity of resource and that simplicity and directness of aim which have long been its characteristics. But yet its defects and handicaps must not be lost sight of,— lack of continuity from frequent change in administration and in party, lack of certainty because of the Senate's control of treaties made by the executive, lack of a trained diplomatic service. In reviewing the diplomacy of the United States as a whole, one is impressed by its blunt straightforwardness (sometimes amounting to crudity or ill manners), by its usual freedom from intrigue, lastly by its rather surprising successes, owing surely to the soundness of its aims. "Observe good faith and justice toward all nations," wrote Washington in his farewell address, "cultivate peace and harmony with all." Could any diplomacy have had a nobler rule laid down for it? See also INTERNATIONAL LAW; TREATIES.

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18. THE WAR WITH FRANCE. The outbreak of war in 1793 between Great Britain and the French Republic placed the United States in a most embarrassing position. President Washington determined to adopt a policy of neutrality, but for two reasons he found it very difficult to do so. In the first place were the treaties concluded with France in 1778. The treaty of alliance guaranteed forever the integrity of the French possessions in America, and the treaty of commerce provided that French privateers and their prizes should have shelter in United States ports, a favor which was denied to the enemies of France. The question of the privateers gave most trouble. If the United States had adhered strictly to the obligations of the treaty they could not have preserved neutrality. Fortunately, at a critical time, the President's position was strengthened by the intemperate conduct of the French Minister, Citizen Genet (q.v.). The encroachments of the belligerents upon our trade rights constituted a second obstacle to the maintenance of a neutral policy. The British and French appeared to vie with each other in their zeal for seizing and confiscating American merchantmen and their cargoes. Many of these outrages could not be justified even under their own extravagant interpretation of the principles of international law. The partial compromise of the troubles with Great Britain in 1794 served to increase the hostility of France.

In March 1797, just after the inauguration of President Adams, news was received that the French Directory had refused to accept Charles Cotesworth Pinckney, who had been sent to supersede Monroe as Minister. Desiring to bring about a peaceful settlement if possible, Adams sent Elbridge Gerry and John Marshall to join Pinckney in a special mission. Shortly after their arrival in Paris they were approached by some agents of Talleyrand, who informed them that the Directors were much annoyed at certain remarks made by President Adams in a recent speech, but that a *douceur* of 1,200,000 lires would probably mollify their wrath. Negotiations went on for several weeks, but as the commissioners refused to submit to blackmail, nothing was accomplished. On 5 March 1798 the President informed Congress that certain dispatches had been received from France, which he would lay before them as soon as they could be deciphered and translated. A second message dated a fortnight later stated that the peace mission had been a failure and urged Congress to prepare for war. The Federalists were jubilant and the Republicans very much disconcerted. The publication of the dispatches, however, aroused such strong popular feeling against France that the moderate Republicans gave up their opposition. These documents became known as the X.Y.Z. Correspondence (q.v.), because the government used those letters in referring to Talleyrand's representatives. Both houses of Congress agreed by large majorities to support the President's policy. An act was passed establishing the Navy Department, and Benjamin Stoddert of Maryland was appointed as the first secretary. Previous to this time naval affairs had been in charge of the War Department. Money was appropriated to equip the navy, to strengthen the coast defenses and to buy arms and ammunition. An act of 14 July 1798 levied a tax on houses, land and slaves, the first national direct tax ever imposed in the United States. Of more doubtful wisdom were the Naturalization, Alien and Sedition acts, which were directed against French sympathizers.

The President's course was approved with as much enthusiasm by the public as it was by Congress. "Millions for defense, but not one cent for tribute," became the popular cry. Scores of patriotic war songs were written, among them being "Adams and Liberty" and "Hail, Columbia." Monster mass meetings were held throughout the country, militia companies were organized and liberal contributions were made for the support of the infant navy. The President continued his preparations for war, then, with every assurance that the nation would support him. Washington was called from retirement to assume the duties of lieutenant-general and commander-in-chief of the army. Naturally much was left to his discretion in the choice of subordinates. Hamilton, Knox and Charles Cotesworth Pinckney were, at his suggestion, commissioned as major-generals. An unfortunate controversy at once arose in regard to the question of seniority. Adams favored Knox, and gave an order that his commission should be made out before the other two. This plan was so strongly disapproved by Washington that the President finally yielded, and Hamilton was made second in command. Four brigadiers were appointed, and steps were taken to increase the army to a war footing. These elaborate preparations for the strengthening of the land forces seem somewhat premature. It was not at all likely that France would attempt an invasion, and, unless Spain should be drawn into the conflict, there was no territory in America which we could attack. As a matter of fact, hostilities were confined to a few minor naval engagements. Early in July 1798 Stephen Decatur, the elder, in command of the sloop of war *Delaware* seized a French privateer mounting 20 guns. The prize was refitted, named the *Retaliation* and placed under the command of Captain Bainbridge. The most serious battle of the war was fought off the island of Saint Kitts in February 1799. After a chase of three hours and a fight of an hour and a quarter, Commodore Truxtun's flagship, the *Constellation*, forced the French frigate *L'Insurgente* to lower its colors. *La Vengeance*, another French frigate, attacked by Truxtun in February 1800, escaped only as the result of an accident. Just as the victory was almost won the foremast of the *Constellation* fell over the side, drowning a young midshipman and several of the crew and making it impossible to continue the pursuit of the enemy.

In spite of these successes the President

manifested very little zeal for the prosecution of the war. This was doubtless due in part to jealousy of Hamilton, but it was mainly the result of his intense conservatism. John Adams was not the man to sympathize with the hair-brained schemes of Hamilton for the conquest of the Floridas, and he was certainly not the man to continue a war when there was no longer good cause for it, merely because public opinion seemed to favor it. Hearing that the French government would receive a minister from the United States and would treat him with courtesy and respect, he nominated William Vans Murray to that position. The members of his own party were taken completely by surprise, and the leaders of the war faction made an attempt to defeat Murray's confirmation in the Senate. Adams checkmated their plans by withdrawing Murray's name and substituting three commissioners, Murray, Chief Justice Ellsworth and Patrick Henry (25 Feb. 1799). Henry refused to accept, and William Davie of North Carolina was selected in his stead. Much to the chagrin of Hamilton, the Senate confirmed the nominations. The Hamilton partisans in the Cabinet now made a final attempt to delay the departure of the commissioners, but their success was of short duration. The President asserted his authority, and the commissioners set sail in October 1799. The Federalists throughout the country were at first surprised, not to say disgusted, at the peace policy of the chief executive. Hamilton's intrigues to checkmate his plans, moreover, resulted in a revulsion of feeling, and it may safely be said that the commissioners sailed with the approval of the vast majority of the American people.

The mission was successful. A treaty of peace was concluded with the first consul, 30 Sept. 1800. Provision was made for the restoration of captured ships and goods which had not yet been condemned. For protection in the future the rule was adopted that "free ships make free goods," except in the case of contraband of war. The terms blockade and contraband were defined, and certain regulations were made in regard to prizes and privateers. The most serious problem arose from the desire of the United States to be released from the obligations of the treaties of 1778 and the desire of France to avoid paying indemnities for the American vessels and cargoes which had been confiscated. Article II of the new convention provided for the postponement of both questions until a future settlement, with the understanding that in the meantime the treaties of 1778 should not be in force. Strong opposition was made in the Senate to this article on the ground that it sacrificed the claims of American merchants. It was finally struck out and a clause was inserted limiting the convention to eight years. In this amended form the treaty was returned to France. Napoleon ratified it with the proviso that each country made the concession which the other demanded. The Senate passed the final vote of ratification with this understanding. It was this bargain which gave rise to some of the French spoliation claims. The obligations of France were, of course, not to the United States government, but to American citizens who were engaged in foreign trade. Consequently when our government released France from those obligations, it tacitly assumed them itself. This treaty of 1800, like the Jay Treaty with England, was really only a temporary settlement. The troubles with both countries continued until the close of the great European conflict on the battlefield of Waterloo. See TREATIES; UNITED STATES — DIPLOMACY.

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19. THE LOUISIANA PURCHASE. The vast province of Louisiana was ceded by France to the United States 30 April 1803, the purchase price being $15,000,000. Originally belonging to France, Louisiana was ceded to Spain by the Treaty of Paris in 1763, and was retroceded to France for the purpose of colonization 1 Oct. 1800, with the understanding that if it was ever again ceded away it should revert to Spain. It was shortly after President Jefferson's installation that information concerning the retrocession of Louisiana to France reached America. Though the act was believed to be hostile to the interests of the United States, yet Jefferson hoped to maintain the friendly relations with the French government so recently restored by the so-called Treaty of Morfontaine. But when the Spanish intendant, Don Juan Ventura Morales, closed the port of New Orleans to American trade, Jefferson began to see the purpose of the first consul in securing the retrocession of Louisiana and to experience a foretaste of Bonaparte's aggressive policy. Morales' act in closing the right of *entrepôt* at New Orleans, as the right of deposit was called, was regarded throughout the United States with feelings of strong disapproval. Excitement ran high, especially in Tennessee and in Kentucky, in which States the people were eager for war. The Western settlers looked upon the summary closing of the port as the initial step in Bonaparte's aggressive policy, which contemplated not only the arrest of American trade development, but also of any farther expansion toward the Mississippi. The Western traders had chafed greatly under Spanish authority along the banks of the Mississippi. Spain blocked the way to farther expansion on the west and held control of all the waterways leading to the Gulf of Mexico, since the entire seaboard along that gulf was under Spanish dominion. Moreover, the whole valley of the Ohio as far as Pittsburgh was dependent upon the permission of the king of Spain for an outlet to the Gulf for its rapidly increasing trade with the outside world. This permission the king granted, and by the treaty of 1795, which Godoy executed by way of offsetting Jay's Treaty, Spain gave the United States special privileges along the Mississippi, as the right of deposit at New Orleans with

only a nominal charge. Still the Western traders were subjected to much annoyance under Spanish rule, and a growing desire manifested itself to expel Spain from that region and to annex her rich territory to the United States.

After Charles IV ceded Louisiana to France and Spain retired from the Mississippi, conditions were not improved, but rather aggravated, since the Western States feared Napoleon's grasping ambition quite as much as they had despised King Charles' authority. When, therefore, the port of New Orleans was summarily closed, preparatory to the transfer of that region to France, there was such an outburst of popular feeling throughout the United States that President Jefferson was constrained, despite his strong desire for peace, to open negotiations immediately for the purchase of West Florida and New Orleans, as affording an outlet to the sea. Accordingly, he instructed his Ambassadors at Madrid and Paris, if possible, to obtain from their respective governments the cession of West Florida and New Orleans. Congress was fully alive to the demands of the people, and on 12 Jan. 1803 appropriated $2,000,000 with a view to purchasing the desired territory. Jefferson appointed James Monroe as Minister Extraordinary to France to aid Chancellor Livingston, United States Ambassador at Paris, to effect the purchase of New Orleans and West Florida. When Monroe set sail for France, on 8 March 1803, Jefferson was not at all confident that Monroe's mission would be successful. He admitted that he sent him largely to conciliate the people and to restore political quiet throughout the country, then much worked up over the situation.

In treating for the purchase of West Florida and New Orleans Monroe's instructions included three contingencies: Monroe and Livingston were to buy the desired territory if it could be bought for any sum not exceeding $10,000,000. They were to offer besides the purchase price, commercial privileges for 10 years in the ceded ports, the incorporation of the inhabitants on an equal footing with the citizens of the United States, and, if demanded, even a guaranty of the west bank of the Mississippi. As a second contingency, in case France refused to sell the territory in question, the ambassadors were instructed to sue for the right of deposit, together with such privileges as France would grant. In the event France acceded to neither of these propositions, then the ambassadors were to be given special instruction by Congress adapted to the case. This last contingency might mean war, or it might mean further procrastination. In a communication to the first consul, delivered through Pichon, Jefferson had already hinted at a probable alliance with England in case France declined to accept any terms whatsoever and positively refused relief to the United States from the severe conditions of trade along the Mississippi. When Livingston and Monroe first opened negotiations through Talleyrand for the purchase of New Orleans and West Florida, the French Minister of Foreign Affairs held out but little hope. The American ambassadors used every argument, but to no purpose, apparently. However, the aspect of affairs soon changed. The first consul was growing weary of the drain on his resources which Santo Domingo entailed. He reflected, too, that he would soon need all the men and money he could command for the execution of his plans in Europe. When, therefore, he received intelligence of the death of Leclerc in Santo Domingo and the annihilation of his army and the general uprising of the negroes of that province, he realized that the offer of the United States furnished him a suitable occasion for abandoning his costly schemes of French colonization in America, under cover of a new enterprise, and he gladly closed with the American ambassadors to cede to the United States the whole of Louisiana for the largest sum he could obtain. He needed money to replenish his exchequer for his contemplated war with England and Germany, and he did not hesitate to break his word with Spain in ceding away Louisiana, which act, perhaps, he intended as a punishment for Spain for Godoy's treaty with the United States. The American ambassadors, astonished at the offer to sell the whole or no part of Louisiana, though not authorized to purchase the entire province, wisely closed with Talleyrand and Marbois and agreed to buy the whole of Louisiana. After some haggling over the price, Livingston and Monroe agreed to pay France $16,000,000. The documents were signed early in May and antedated to 30 April 1803, and thus the United States, beyond the expectation of all, acquired possession of the vast province of Louisiana.

The treaty for the cession of Louisiana is notable in that it contains no definition of the boundaries of the property transferred. When the American commissioners insisted that the boundaries of Louisiana be defined, they were merely informed that the boundaries were the same as they were in the hands of France, according to Berthier's original treaty of retrocession. However, it was definitely understood on both sides that the Floridas were not included in the transfer, since that territory did not belong to France. Article III of the treaty provided that "the inhabitants of the ceded territory shall be incorporated in the Union of the United States, and admitted as soon as possible, according to the principles of the Federal Constitution, to the enjoyment of all the rights, advantages and immunities of citizens of the United States." In addition to the sum of $11,250,000, which the United States promised to pay France, the United States agreed to assume the spoliation claims of American citizens against the French government, amounting to $3,750,000, thus making the price in all $15,000,000. The ratification of the treaty by the Senate of the United States gave rise to a perplexing constitutional question as to the right of Louisiana to be admitted into the Union and the process to be adopted. President Jefferson recommended, since there was no authority in the Constitution to buy foreign territory, that a constitutional amendment be adopted as the most convenient solution of the problem. However, the treaty was at length ratified without recourse to a constitutional amendment, and the President acquiesced even at the risk of making blank paper by construction of the Constitution. Spain protested vigorously against the cession of Louisiana to the United States, alleging that the first consul had violated the treaty of retrocession and claiming that the province could be ceded to herself only. But when the Spanish government realized that both the

United States and France were resolved to make good the transfer, even by a resort to arms, if need be, Charles IV yielded and accepted the cession as inevitable. Thus, for $15,000,000, the United States added to her territory a vast region extending from the Mississippi to the Rocky Mountains and from Mexico to the Lake of the Woods. The annexation of Louisiana not only increased the territory of the United States by an immense area, but it also put a new complexion upon the politics of the nation and marked a new epoch in the national life. See LOUISIANA PURCHASE.

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20. CAUSES OF THE WAR OF 1812. The latter years of the 18th and the earlier years of the 19th centuries witnessed a phenomenal growth of American commerce due to incessant wars in Europe. Naturalization was easy in the United States and the wages of seamen were high. Great numbers of English sailors availed themselves of these advantages. England became jealous of American trade. She had never granted to her subjects the right of expatriation, though she gladly recruited seamen wherever they could be found. In 1793 the right of searching neutral, especially American, vessels was claimed and put into practice. This so-called right meant that wherever an English warship met American merchantmen or war vessels they were required to stop, order their men on deck and permit as many sailors to be seized and forced into the English service as were unable to prove their nationality. It was maintained that only deserters from the English navy were wanted; but in the period of 1796 to 1802, 1,942 American seamen were pressed into the English naval service on the plea that they were deserters.

When the war between Great Britain and Napoleon broke out afresh in 1803, American trade received another impetus. French, Spanish and even English traders raised the American flag in order to get the advantages of neutrals. An arrangement between England and the United States permitted American vessels to take in cargoes in her colonies provided these commodities were consigned to United States ports. The cargoes were afterward reshipped to Europe. This arrangement gave rise to great abuse. Ship-owners learned to touch at American ports, unload their cargoes, pay the required tax in the form of a bond, reload and, at the same time receiving their bonds back again, set sail for foreign markets. Thus it appeared that England's commerce would fall into the hands of her rivals. To break up this almost illicit trade and at the same time bring the impressment policy more strictly to bear upon the Americans, British war vessels were stationed just outside the more important ports of the United States. In the rigor of this surveillance American citizens were seized and American vessels confiscated in larger numbers than ever before. English cruisers virtually blockaded the Atlantic Coast from Maine to Georgia. On 27 June the British war vessel, *Leopard*, under orders from the British admiral at Halifax, signaled the *Chesapeake* to stop as she was leaving Norfolk Harbor. An officer was sent aboard the *Chesapeake* to search for deserters. Commodore Barron of the *Chesapeake* refused to muster his men. Thereupon the *Leopard* opened fire and, taking the *Chesapeake* by surprise, speedily disabled her; three men were killed and 18 wounded. When the search was completed only one Englishman was found. Nevertheless, three American sailors were taken away, one being a negro. The "*Chesapeake* affair" excited the people of the United States almost beyond precedent. Indignation meetings were held in most of the towns. Prominent men presided over these gatherings; thousands of petitions calling loudly for reparation were sent to the President. War soon became the cry. President Jefferson did not believe in war, but he felt keenly the force of the insult and, after forbidding American harbors to English war vessels, he sent an agent to England to demand disavowal of and reparation for the attack on the *Chesapeake*. England paid no attention to the President's representations.

While English-American relations were thus assuming a threatening attitude neutral trade was suffering still further restrictions in Europe. In May 1806, provoked by Napoleon's closing the ports of Hamburg and Bremen, England declared, through her Orders in Council, the coasts of Belgium, Holland and Germany to the mouth of the Elbe in a state of blockade. On 21 Nov. 1806 the French emperor replied by the Berlin decree which declared a similar blockade of all the ports of England. Neither the orders nor the decrees could be enforced, but they made trade with England, France and Germany unlawful. Yet during the year 1807 still other Orders in Council were issued. These closed to neutral commerce all the ports of European states friendly to France and authorized the seizure of any neutral vessel en route to any closed port unless its captain first entered an English harbor, subjected its cargo to taxation and obtained a license to trade. Napoleon's reply was the Milan decree, which ordered the confiscation of every neutral vessel that permitted itself to

be searched or in any wise recognized the British Orders in Council.

The British orders and the French decrees, the so-called right of search and finally the actual attacking of American war vessels seemed to leave the United States government no peaceful way out of her situation. President Jefferson, however, suggested in 1807 that an embargo be laid on all American shipping. Congress had already prepared the way for such a policy at its previous session in the Non-Importation Law which had not been put into force until a few weeks before. Congress assembled in November 1807 and immediately fell in with the President's idea of starving Europe into a recognition of the rights of neutral trade. The embargo went into effect in December 1807 and remained in force until 4 March 1809. This law solved none of the difficulties it was intended to solve. Opposition to the measure became so great that an Enforcement Act was passed. This gave the President despotic powers; yet the commercial sections of the country resisted the law and smuggling became so general in New England that local officers of the United States declined to make any effort to stop it. The South suffered much hardship, too: tobacco and wheat, the principal commodities of export, shrank to one-half their former value. The Union itself seemed about to go to pieces just before the close of Jefferson's administration.

In place of the embargo a second Non-intercourse Act was substituted, which, though it practically prohibited trade with the great warring powers of Europe, gave some promise of improving the condition of commerce. With this change of policy Madison became President, 4 March 1809. England now sent a new Minister, David Erskine, who speedily negotiated a treaty which promised the withdrawal of the Orders in Council. Madison suspended the non-intercourse against Great Britain on 10 June 1809 by proclamation. The merchants and ship-owners who had respected the non-importation hastened their goods and ships to sea. On 10 June 600 vessels sailed from American ports to take chances with their enemies in Europe. In July the news that Erskine's Treaty had been disavowed by the London Cabinet and that Erskine himself had been recalled came as a painful surprise to the American people. Madison issued at once a second proclamation which recalled the first and replaced the former restrictions on English trade. The British Cabinet now sent F. J. Jackson to the United States. Jackson completed the alienation of the American government. He insulted the President and ruined his own cause by insisting that Madison had duped Erskine into signing the recent treaty. The new Minister was summarily dismissed. Rose, another British representative, appeared next year in Washington, but his efforts availed nothing so long as his government forbade him to yield the great point in question — the repeal of the Orders in Council.

The year 1809 proved the non-intercourse ineffective, more injurious to Americans than to England and France, for now both powers had a chance to enrich themselves by enforcing the laws of the United States against her own commerce. Napoleon proposed in his Rambouillet decree (March 1810) to seize every vessel within his reach, that is, in the French harbors, on the ground that such vessels had, perhaps, recognized England's Orders in Council and were thus subject to his Milan decree; or if not, then they had violated the laws of their own country in offering to trade at all with either France or England. In a few months $10,000,000 worth of property was thus seized and finally confiscated. Before Napoleon issued his Rambouillet decree the American Congress had resolved to repeal the Non-importation Act. In place of it a new law was passed which held out a sort of bribe to England and France: in case either nation should cease to violate the commerce of the United States then non-importation should be revived against the other and maintained until neutral trade ceased to be violated. Napoleon again turned an American law to his own advantage: he announced that his decrees would be suspended as against the United States after 1 Nov. 1810, if by that time England had suspended her orders or if the United States "caused her flag to be respected." However, he continued to sequester American cargoes. President Madison considered this a sufficient concession. He gave England warning that non-intercourse would be enforced against her if the orders were not rescinded by 2 Feb. 1811. When the time expired, no action having been taken by England, Congress renewed the former law and prohibited all importation of English goods. This caused some alarm in England, but there was no abatement of impressments. A new Minister was sent to Washington. His instructions, however, still permitted no promises of any change in British policy.

While the ire of America was constantly rising there came the news in May 1811, only three months before most of the Congressional elections were to take place, that the United States frigate, *President,* had encountered the British sloop, *Little Belt,* after a hot chase of several hours, and practically annihilated her. Never was news more welcome to American ears. The "*Chesapeake* affair" had been avenged. Minister Foster wrote his government that the Americans no longer pressed for reparation on that score. Public meetings were again held and the newspapers, especially in the South, were filled with exaggerated accounts of what had happened. Other events occurred during the summer and autumn of 1811 which tended to hasten the breach with England. The Indians on the western frontier from Fort Dearborn to northern Georgia formed a confederation against the United States. Tecumseh, the famous Shawnee chief, was the soul of the movement. It came to a battle at Tippecanoe, in western Indiana, on 7 Nov. 1811. The Americans, under Gen. William Henry Harrison, gained a complete victory. Tecumseh joined the English soon after and the general belief that England instigated the Indian attacks was confirmed. Harrison's victory was the second good omen of the year.

Notwithstanding all these causes for war it is quite probable that the government would not have declared hostilities the next year but for the revolution which took place in the Republican party — the controlling party since 1801. This party had come into power as an uncompromising opponent of English influence in the country. It had, however, for its leader

and founder a man who opposed war from principle — Jefferson. The old Republicans, coworkers with Jefferson, had become so opposed to war that they permitted themselves to be isolated. The events of 1811 taught the people a bolder policy. The antipathy for England which pervaded the ranks of the party had outgrown peaceful embargoes and non-importation laws; men thought again of the Revolution. They elected new representatives to Congress. The new Congress had a membership of 140; on its assembling more than 70 were found to be young and untried politicians. The most important of these new men were Henry Clay of Kentucky and John C. Calhoun of South Carolina. When Congress met the younger element evinced a war-like feeling quite unusual in that body. Clay was at once elected speaker of the House and with the aid of his friends he organized that branch of the legislature for the purpose of war. These young leaders were vigorous nationalists; they thought of the Union as a great state; they looked to the future and had confidence in the Republic; they were imperialists who not only hoped to compel Europe to respect their flag but who aimed to conquer and annex Canada. They counted on using their strength to the utmost advantage against England because of the impending struggle with Napoleon. In this President Madison joined them. From November 1811 to the end of the session the new party exercised all its ability and ingenuity in persuading Congress and the country to prepare for hostilities. After long and weary debates and after many a compromise on army and naval matters, war was at last declared 18 June. The invasion of Canada had already begun. See TREATIES; INTERNATIONAL LAW; UNITED STATES — DIPLOMACY.

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21. THE WAR OF 1812. The War of 1812 began officially on 18 June. The army of the United States numbered at that time 6,744 regulars. It was poorly equipped, poorly drilled and its morale was extremely low. But Congress had authorized its increase to 25,000 and provided, at least by law, for a second volunteer army of 50,000 men; besides, the militia of the several States was called on to co-operate with the regulars and the volunteers. The result of these acts was very unsatisfactory. The regular army never during the war reached 10,000, the volunteers appeared only in small numbers and the militia offered to serve only for short terms and then preferably in their own States. The governments of the New England States prohibited their militia from going beyond their State boundaries and various obstacles were put in the way of enlisting. The South was too remote from the theatre of action to feel the need of sending the militia to the front. Tennessee, Kentucky and the old Northwest furnished the main body of soldiers, regular and irregular, who fought in this war. The American navy apparently promised still less at the beginning of the conflict. It consisted of seven frigates and nine smaller craft. And as to the sinews of war, the treasury was in a precarious condition as a result of the numerous trade regulation acts of Jefferson's and Madison's administrations. Congress was inveterately opposed to laying new taxes in any form. Loans had to be resorted to at the beginning. But the bulk of the capital in the country was in New England and New England was bitterly opposed to the war. Hardly half the money asked for was subscribed. On the other hand, England was contending in Europe with her great enemy, Napoleon. The British troops in Canada numbered barely 7,000; their line of defense was 1,000 miles long. The English navy was, however, the undisputed mistress of all the seas; the north Atlantic squadron counted three battle ships, 20 cruisers and 50 smaller ships.

The conquest of Canada was made the first object of attainment. An army of 1,850 men, under command of Gen. William Hull, crossed the Detroit River in the latter part of July 1812. Hull threatened the British stronghold, Malden, for a few days; but hearing that the English and their Indian allies had seized Mackinaw, a fort at the head of Lake Huron, he retreated across the American border to Detroit. From this point Hull hastened off two regiments to oppose the advance of the enemy from the west. At this juncture the British Major-General Brock crossed the river and demanded the surrender of the Americans. Hull's supplies were already becoming scarce, his basis of operations was 200 miles south and his communications were most difficult to maintain. He surrendered the fort and all the troops under his command, without a fight, on 14 Aug. 1812. Some 2,500 men, 33 guns and the whole of Michigan were thus lost at the beginning of the contest. The principal cause of this was the failure of General Dearborn to march into Canada from the eastern end of Lake Erie, according to the plan of the campaign, and thus cut off all supplies from Brock and finally force him to surrender. But while Hull made his way through dense forests to Detroit, Dearborn was in Boston attending to the political side of the war. Not until October, nearly two months after the disaster at Detroit, did Dearborn cross the Niagara; and then it was with only a small part of his army under the command of Van Rensselaer, a New York militia commander. Van Rensselaer attacked Queenstown (13 Oct. 1812), and was repulsed by General Brock, who had hastened from the scenes of his recent triumph to check this second movement. He was successful, though he was killed in the engagement. The campaign closed with the enemy in possession of the Western forts and the Territory of Michigan to the Maumee River. In the East the border remained the same.

But while things had thus gone ill on land, the navy had in a measure restored American confidence. The frigate *Constitution*, Capt. Isaac Hull in charge, met the British *Guerrière* about 800 miles northeast of Boston on 19 Aug. 1812 and captured her after a fight of 30 min-

utes. Hull reduced his enemy's ship to a complete wreck, killed or wounded one-third of their crew and received the remainder as prisoners of war. On 18 October, the American sloop, *Wasp*, met the British sloop, *Frolic*, and completely demolished her and on the 25th the *United States*, a frigate of 44 guns, fought the British frigate, *Macedonia*, 38 guns, and gained as signal a victory as that of Hull over the *Guerrière*. This telling work of the navy took the world by surprise. England forbade her sea-captains to fight American ships of superior tonnage. American privateers swarmed the Atlantic. They did effective work. It became dangerous for an English merchantman to cross the English Channel. They captured 500 vessels during the fall and winter of 1812–13. Marine insurance for the Irish Sea rose to 13 per cent.

The campaign of 1813 centred about Lake Erie. Gen. William Henry Harrison had led an army of militia, volunteers and regulars from Kentucky during the preceding summer with the object of reconquering Detroit. The winter and spring of 1812–13 were practically wasted; but news reached him, while still in upper Ohio, 12 Sept. 1813, that Commodore Perry had annihilated the enemy's ships on Lake Erie, and he began to move forward more rapidly. Perry had devoted the spring and summer to the construction of a fleet which he thought would break the power of the British on the lake. On 10 September Perry came up with the enemy's vessels under command of Captain Barclay. After a serious mishap to his flagship Perry took command of the *Niagara*, came within close range and after two and a half hours of heroic fighting completely defeated him. Thenceforth the lake remained in American hands. Harrison was now on the offensive. With the aid of R. M. Johnson's regiment of cavalry he forced Proctor, the English commander, across the Detroit. Proctor remained a few days at Malden, but, very much to the chagrin of his Indian allies, he continued his retreat northward. On 5 October, on the north side of the river Thames, he gave battle to his pursuers. Proctor lost his entire army; the Americans lost 15 killed and 30 wounded. Upper Canada fell into American control. At the eastern end of the lake and looking to the gaining of Lake Huron, General Dearborn made several half-hearted moves. On 27 April 1813, the town of York (now Toronto) was attacked. A sharp battle ensued. The Americans were successful and in the disorder which followed the victory the government house was burned. A month later Commodore Chauncey compelled the English to evacuate Fort George on the Niagara, while the English made an unsuccessful attempt on Sackett's Harbor. An expedition to Montreal under the command of General Wilkinson proved a signal failure. The year closed with Lake Ontario still in English hands. At sea the Americans were unable to hold their own. On 1 June the frigate *Chesapeake*, commanded by Captain Lawrence, was defeated and destroyed by the British frigate *Shannon*. The enemy now blockaded the whole Atlantic seaboard.

The year 1814 brought Napoleon's overthrow and consequently peace in Europe. Veteran troops were sent to Canada and to the South. But the Americans were becoming inured to war; there was a more general support of the administration. After some feeble movements in the spring a third invasion of Canada was begun. The Americans numbered 4,700; the enemy was equally strong. At Chippewa an attempt was made to check the invasion but without success. On 25 July Lundy's Lane, the bloodiest battle of the war, was waged. The British were 3,000 strong; the Americans 2,600. The greatest valor was manifested on both sides; the losses amounted to about one-third of the forces engaged. Both sides claimed the victory; but the invaders held their ground until autumn when they withdrew to the Niagara. In September an invasion of New York was attempted from the Canadian side. The line of Lake Champlain and the Hudson River was selected; but Commodore McDonough foiled the plan in the famous battle of Plattsburg on Lake Champlain on 11 Sept. 1814. The campaign closed with no serious advantage gained on either side. To divert attention from Canada the British Cabinet had sent an army of 3,500 men under General Ross to threaten Washington. Finding the capital so poorly defended, Ross landed his force, marched directly on the city, and, though meeting with some feeble resistance at Bladensburg, drove the government into the woods and set fire to the public buildings — in retaliation for the destruction of the public building at York a year before. Ross now turned his attention to the city of Baltimore. Here he met with some resistance, the general himself being killed in the attack.

New Orleans was the next object. There was chance here of Indian support from northwestern Georgia. An army of 6,000 British regulars sailed for the Mississippi under command of General Pakenham. It appeared a few miles southwest of New Orleans (q.v.) on 23 Dec. 1814. The Americans were commanded by Gen. Andrew Jackson. Before the decisive engagement occurred both armies had been augmented to about 8,000 men each. Jackson fortified himself a few miles below the city and awaited the approach of Pakenham; on 8 January at early dawn the battle began. Seeing his men waver, Pakenham undertook to rally them. He was instantly killed; repeated efforts were made to carry the American works, but without avail. The English withdrew, having lost 2,036 men killed or wounded. Jackson's loss was 71.

On 24 Dec. 1814 the treaty of peace had been signed in Ghent. No mention was made in the treaty of impressment of sailors, of the right of search or of the status of neutral trade. The fall of Napoleon had made these questions obsolete. As to boundaries neither party gained anything. The cost of the war had been $100,000,000, 1,400 ships of all kinds, 21,000 sailors and about 30,000 soldiers killed or injured. Its benefits were the rise of a truly national spirit, the weakening the State supremacy of former days and the consequent overthrow of the half-treasonable opposition of New England. For bibliography see CAUSES OF THE WAR OF 1812.

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22. FINANCES (1789–1816). Finances of the United States government in 1789 were in a most unfavorable condition. Not only had the Revolutionary War left a legacy of national indebtedness, amounting in 1784 to $39,000,000 exclusive of the continental bills of credit, but owing to the defective revenue system prescribed by the Articles of Confederation, no adequate provision could be made either to pay the principal or to meet the annual interest charges. When the new Federal government under the Constitution was established, the debt had swelled to $54,000,000; of this $11,700,000 was owed abroad. In addition to the above obligations, there was an unknown amount of State indebtedness, approximating $20,000,000. The total debt was a heavy burden for a population of less than 4,000,000 and for a country as yet undeveloped in its material resources.

In 1790 Congress enacted an elaborate funding scheme providing for three loans, the first of $12,000,000 to take up the foreign indebtedness; a second, to the full amount of the domestic debt, accepting at face value all obligations previously authorized, excepting bills of credit which were rated at 100 to 1; and a third of $21,500,000 to cover such State indebtedness as has been incurred for war purposes. The act was a complicated measure with ingenious contrivances, not only to make the loans acceptable to holders of old obligations, but also, by varying rates of interest and deferred interest on a portion of the debt, to afford the new government time to recover from its financial misfortunes. On two points there was bitter opposition to the passage of the act: (1) From those who objected to the acceptance of old certificates of indebtedness at their face value, inasmuch as these had passed current at depreciated value, and had fallen into the hands of speculators; (2) from the Southern States which had paid off a larger share of their indebtedness, and consequently were unwilling to be burdened with the debts of States which had been less self-sacrificing. The first objection was met by the firm contention that national credit could not tolerate discrimination; the second was removed by a shrewd bargain which established the new capital in Southern territory on the boundaries of Maryland and Virginia. In 1795 after the funding operations were over, the total debt amounted to $80,700,000, bearing an annual interest charge of about $3,000,000.

The revenue system established in 1789 was of simple character. A tariff act with low rates was passed; specific duties were placed on about 30 articles; ad valorem rates of from 7½ to 15 per cent on a few specified commodities, and a 5 per cent ad valorem rate on unenumerated articles. Tonnage duties were included, and the principle of discrimination against goods imported in foreign vessels and foreign shipping was adopted. Although the rates imposed in this tariff were low, the debate on the measure as well as the preamble of the act shows that the principal of protection of home industry was recognized.

In the law establishing a treasury department, provision was made for a Secretary of the Treasury, a Cabinet position; for a comptroller to pass on the legality of bills presented against the government; for an auditor responsible for the accuracy of the accounts; for a register to preserve the accounts; and for a treasurer to receive and pay out money on presentation of proper warrants. The framework of this system has continued until the present time and has proved highly effective in safeguarding the government against illegal expenditures. Alexander Hamilton (q.v.) was chosen Secretary of the Treasury, and by his constructive genius, exhibited in a remarkable series of reports on public credit, a mint, national bank and manufactures, encouraged Congress to establish its credit on a broad and generous basis. Through his influence the Bank of the United States was established which granted temporary loans to the government, furnished a sound note circulation and took care of the government funds. In 1791 it was found that additional revenue was needed, and under the advice of Hamilton internal revenue duties were imposed upon the distillation of spirits. This provoked opposition, especially in the agricultural section of the Middle and Southern States. Here it was claimed that the interior was sacrificed to the commercial interests of the Northern seaboard. In 1794 there was open defiance in Pennsylvania, and the Federal troops were called out to put down the so-called Whisky Insurrection (q.v.). It was contended that the collection of the taxes was inconsistent with the principle of individual liberty, that it injured morals by inducing false swearing, was burdensome, and interfered unduly with the business of distilling. Although the opposition failed in its efforts, the tax was not fruitful, amounting in 1793 to only $422,000 from which about one-quarter was deducted for cost of collection and returns for drawbacks. In 1794 excise duties were extended to carriages, sales of liquors, manufacture of snuff, refining of sugar and auction sales. The constitutionality of the carriage tax was assailed on the ground that it was a direct tax and should be levied by apportionment according to population. The Supreme Court, however, in the case of United States v. Hylton (1796) decided that under the Constitution there were practically but two direct taxes, the poll tax and the tax on land, that the carriage tax was an indirect tax and consequently constitutional. Expenditures continued to exceed the earlier estimates; the Indian War of 1790 was followed by the Whisky Insurrection, and in 1797 new military and naval expenditures were demanded on account of the strained relations with France. In 1798 a direct tax of $2,000,000 was laid upon dwelling-houses, lands and slaves. In 1800 the total receipts from all sources was about $10,848,000, of which $9,081,000 was derived from customs and $1,543,000 from internal revenue and the direct tax.

Hamilton resigned from office in 1794 and was succeeded by Oliver Wolcott who maintained the Federalist policy of his predecessor. The administration of each was subjected to severe and bitter criticism by the Republican party under the leadership of Albert Gallatin. Charges were made that the accounts were juggled, that adequate information of the condition of the treasury was not given to Congress, and that appropriations were not made for specific objects but in lump sums, giving undue and arbitrary power to the Treasury Department. In 1801 the Republicans came into

power with Albert Gallatin as Secretary of the Treasury. Economy and abolition of what were regarded as inquisitorial taxes were immediately entered upon. Appropriations for the army, navy and diplomatic service were reduced and the excise duties were repealed. The latter step, however, was taken contrary to the opinion of Gallatin, who wished to husband the resources of the treasury in order to pay off the national debt as rapidly as possible. The commercial prosperity of the country at this period was at a high level; our neutral commerce took advantage of the European wars; exports and imports were large, and customs revenues for several years continued to increase by more than $1,000,000 annually. Notwithstanding the loss of the internal revenue duties and the issue of a new loan of $11,250,000 required by the purchase of Louisiana, the position of the treasury steadily improved, so that the debt was reduced from $86,000,000 in 1804 to $45,000,000 in 1812. The success of this operation was largely due to Gallatin's insistence that $8,000,000 should be annually appropriated to the extinction of the debt regardless of all other demands. Gallatin also introduced the practice of rendering annually to Congress a statement of the finances, and during his administration the policy of making appropriations specific was established.

In order to meet the expenditures of the war with Tripoli a special revenue was created in 1804 by the imposition of additional duties of 2½ per cent on all imported articles paying ad valorem duties; this was known as the Mediterranean Fund. In 1806 the import duty on salt was removed. In 1809 there was a temporary check to the good fortune of the treasury owing to the Embargo Act, but upon its repeal there was prompt recovery. Irritation between England and the United States was deep-seated, and in 1812 the treasury faced a situation for which it was ill-prepared. War with England made a heavy loss in customs revenue, for a large part of the commerce of the United States was with that country; there was no internal revenue system to fall back upon; and the estrangement of the wealthy merchants of New England, who opposed the war, made it difficult to borrow money in that section. The failure to renew the charter of the United States Bank in 1811 also deprived the government of a substantial agency either for making temporary loans or selling securities. Moreover, there were intrigues in the Republican party directed against Gallatin; his influence was so far weakened that in May 1813 he retired from the treasury.

The extraordinary demands occasioned by war were at first met by loans in which short time treasury notes played an important part. Between 1812 and 1816, $84,400,000 of government stock was sold, of which $17,700,000 was redeemed during the period, making a net increase of $66,700,000; $36,600,000 treasury notes were issued of which about one-half were redeemed, leaving $18,400,000 outstanding at the close of the war. Funds were borrowed under disadvantageous terms, a large part of the stock being sold at a discount; of $41,000,000 borrowed up to the end of 1812, New England contributed less than $3,000,000. The financial distress was also aggravated in 1814 by the suspension of specie payments by local banks in all sections of the country except New England; thus the receipts of the government, both for taxes and loans, were in depreciated currency. It is estimated that for loans of over $80,000,000 the treasury received but $34,000,000, as measured in specie. Treasury notes were issued under five different acts; the earlier ones were in denominations of less than $100 and were not designed for circulation; before the close of the war, however, provision was made for the issue of notes as low as $3. With the exception of the last issue all notes were redeemable in one year; and again with the exception of the small notes, all bore interest; none of the notes was legal tender.

Congress too tardily endeavored to enlarge the sources of fiscal supply by increased taxes. The customs duties were doubled at the outset, but this gave little strength, since commerce was almost at a standstill. In 1813 a direct tax of $3,000,000 was levied and internal revenue duties were revived. It takes time, however, to establish the machinery of a new tax system, and no receipts from either of the above sources appear on the books of the treasury accounts until 1814. As a consequence of this feeble financiering, deficit followed deficit, amounting in the years 1812–15 to $68,600,000. Gallatin was succeeded in the treasury by William Jones and George W. Campbell, neither of whom was able to cope with the situation, and in October 1814, Alexander J. Dallas, a conservative Republican and friend of Gallatin, was made secretary. The mischief, however, had already been accomplished, and Dallas was unable while the war lasted to extricate the treasury from the embarrassments occasioned by inadequate taxes and depreciated currency. See UNITED STATES — FINANCES (1816–61).

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23. WESTWARD MOVEMENT. The curtain which veiled far Cathay and the mystic East was raised during the Crusades, but the trade of Europe was blocked by the intrusion of the Ottoman Turks. Adventurous captains, barred by the scimeter in the East, by the cold of the North and the heat of the South, sailed boldly into the West, and consequently brought civilization to the Americas on the eastern rather than the western coast. The American people took up the extension of this triumphal course, and, following the same direction, carried civilization directly across the continent of North America from the Atlantic to the Pacific. In less than three centuries, they traversed the 3,000 miles of continental interior, conquered nature, dispossessed the savages, evicted European rivals, and set up a high form of civilization and government, where formerly were only wilderness and barbarians. This achievement is commonly known as "the westward movement."

Speculation is exhausted in conjecturing the probable result had civilization been cast on the Pacific instead of the Atlantic Coast, and been compelled to make its way across the continent from west to east. Recalling the many chance

discoveries along the Atlantic because captains mistook indentations, one may imagine the numerous accidents which must have resulted along the almost solid Pacific Coast, and the hindrance to the spread of the people because all must come through a few ports. The narrow Pacific Coast plain cannot be compared in size with the great Atlantic plain as a place for recruiting strength before commencing the overland journey. Passing eastward, the inhospitable desert between the Sierra Nevada and Rocky Mountains would have met the emigrants instead of the fertile lands of Tennessee, Kentucky and Ohio. An eastern movement must have been delayed for generations by the impenetrable Rockies and the arid region at their base, just as the western movement stands today blocked while developing a national irrigation scheme. If there be a national destiny shaping our end, it was surely in evidence when directing Columbus to the eastern instead of the western coast.

In 1619 the first successful attempt at colonization within the confines of the British dominions of North America was made at Jamestown, Va. In 1775 the first representative body of men gathered at Boonesborough from four incipient settlements in the present State of Kentucky. It had taken 165 years for the English speech to cover the Atlantic plain, cross the Alleghany Mountains and set up free government within the Mississippi Basin. In 1820 Missouri was admitted, the first State beyond the Mississippi River. Louisiana is not considered because her population was sufficiently complete for admission when she was purchased. It had thus required only 45 years to go from the Alleghanies to the trans-Mississippi region. In 1850, California, the first Pacific State, was admitted. Thirty years only had been required for the people to traverse the remaining half of the continent. The rapid increase in the rate of speed may be attributed to the growth of the protective efficiency of the central government, to the increasing number of people, and especially to improved means of transportation.

The Atlantic Coast Plain, upon which the present United States was born, is a long, narrow strip of comparatively level land, trending from northeast to southwest, and lying, generally speaking, between the Appalachian Mountain system and the Atlantic Ocean. Its width varies from 50 to 200 miles, depending on the approach of the various flexions of the coast to the mountains. Within this long stretch, the battles of the Revolution were fought with a few small exceptions. It was essentially a coast war, the troops being frequently conveyed by transports from one point to another, and a French fleet co-operating with the army during the last general campaign. During the war, the Continental Congress sat at Philadelphia, Baltimore, York, Princeton, Annapolis, Trenton and New York, never more than 150 miles from the coast. It is said that during one of the many dark hours of the contest, Washington expressed his determination, in case of ultimate defeat, to retire with his remaining comrades to the fastnesses beyond the Alleghanies and there continue the unequal contest. Evidence is not wanting to show that many of Washington's fellow-officers and comrades contemplated future residences in the "back lands," as the region beyond the mountains was called. They were "back" lands in the sense that they did not drain through the Atlantic or "front" way. Although claimed by the king ex officio, as "Crown lands," these lands as far west as Britain ruled were demanded by some of the colonies because their charters covered them. Others thought that the Indians owned the lands beyond the mountains, and endeavored to purchase them from the aborigines. The king still insisted that the limits of the 13 colonies terminated on the watershed of the mountains. He did not except even Pennsylvania from this rule in his proclamation of 1763. But the political rebellion arose so soon that the proclamation was virtually null and void, if the Americans should succeed in securing independence.

Several attempts to penetrate the western country were made about the time of the outbreak of hostilities between the colonies and those in authority. The country-dwellers in the uplands of Virginia and North Carolina were restless, fearless and self-reliant. They needed only a rifle, powder and ball for equipment. In this and similar respects, they were the antipodes of their urban-dwelling brethren of the north Atlantic plain. A glance at a map will show that in western North Carolina, the watershed has leaped over to the most easterly of the mountain ridges, leaving a large space of the "back lands" within the limits of this State and Virginia. The Yadkin approaches the watershed upon the eastern side very closely, while the western slope is drained by the Watauga, the French Broad and other headwaters of the noble Tennessee River. Here was probably the earliest carrying place of any magnitude between the Atlantic plain and the Mississippi Basin. Over it passed Daniel Boone, Robertson and other adventurous spirits to form the Watauga Association in the back country in 1772. The map will also show that other streams tributary to the head of the Tennessee take their rise in long parallel valleys in southwestern Virginia. Among them are the Clinch, the French Broad and the Holston. They are almost touched by the headwaters of the James and the south branch of the Potomac. Over the many short portages between the two systems came such hardy men as John Sevier and Richard Henderson to meet the North Carolinians in northeastern Tennessee.

These scattered Watauga settlements, largely in what is now Carter County, Tenn., not only set up the rudiments of government, but also furnished a supply for two great streams of emigrants to the West. One branch passed directly down the Tennessee River, founded Knoxville and planted innumerable villages and homes throughout eastern Tennessee. John Sevier attempted to collect them into his state of "Frankland" or "Franklin," as it was later called. The other branch of people turned directly west across the Clinch and Powell Mountain, passed through the Cumberland Gap and found its way into the limestone valley of the Elkhorn, the "blue grass" region of Kentucky. Watauga hunters encamped there heard the news of 19 April 1775 and named their camp "Lexington," a name the city bears at this time. When independence was announced, there were several thousand people maintaining their stand against the hostile savages and the British in the present States of Tennessee

and Kentucky. Uncertainty of ownership left them almost entirely unprotected. As a defensive measure, George Rogers Clark headed a number of them, together with some Virginia recruits, and marched to destroy Kaskaskia and other former French posts now held by the British. Virginia in this way doubly confirmed her claim to the land north of the Ohio. It is worthy of note that it was a Virginia-Kentucky enterprise and formed no part of the claims put forward in the treaty of peace for American ownership of the "back lands."

The Watauga route, although the first to be used in popular migration, was outranked in age by the Potomac-Monongahela portage path. It was the one which young Washington chose across the mountains when warning the French from the "back lands"; along it Braddock led his ill-fated expedition, and over it Washington brought back the survivors of that disastrous excursion into the Western country. It required the shortest carrying over the Alleghany watershed and evidently awaited only the pacification of the Indians north of the Ohio to become the great thoroughfare to the West. The conduct of the Revolutionary War had made the Lake Champlain route to Canada familiar. At Albany the Mohawk invited travelers to the west to follow its charming valley to Lake Oneida, and thence by the Oswego River to Lake Ontario. Washington, Lafayette, Madison and Hamilton made short trips in this direction after the war. But it was a long and perilous way to the Western lands, involving passing through the undependable Iroquois, a canoe trip on two great lakes and a long portage about Niagara Falls. This route, destined eventually to become the most popular, was very tardily developed. A fourth route would be opened in time about the southern end of the mountains, but not until the Creeks and the Cherokees could be removed from the way or could be pacified.

These were the four great ways from the Atlantic to the interior. Pioneers on foot and in "dug-outs" pushed their way across upland, through forests and along the streams. The northern portage is now used by the New York Central and West Shore railways and by the Erie Canal; the Pittsburgh route by the Pennsylvania and Baltimore and Ohio railways; the "Wilderness Route" by the Chesapeake and Ohio, the Norfolk and Western and the Southern Railway lines, and the extreme southern route by the many east and west systems centring in Birmingham, Ala. In the many changes from "dug-out" to palace car, the people have never abandoned the line of least resistance for travel.

Among the many inducements held out in recruiting for the Revolutionary service was the promise of "a good farm." Led by visions of this bounty land, officers and men, at the close of the war, banded themselves together for the purpose of migrating to the "back lands," which had been won by their valor. This they would do not only for bettering their condition, but also for protecting the frontier against the Indians, the Spanish in the Floridas and the British in Canada. Efforts to satisfy these ambitions brought about the cession of the western lands by the States to the national government, the creation of the Northwest Territory (q.v.), the sale of 1,000,000 acres to the Ohio Land Associators and the first settlement north of the Ohio made at Marietta, 1788. However, occupation of the land north of the river progressed but slowly until the victory of Wayne over the Indians and the resulting Treaty of Greenville in 1795.

The year 1790 marked an important stage in the history of the westward movement. The constitutional government under President Washington had been established the year before. One of his duties was to make a numbering of the people so that an equal representation in Congress might be had. The first census taken in 1790 enabled us to know the number of people in each county and town and hence the distribution of population. It showed that little "islands" of people had run far ahead of the main body and established themselves, as already described, in Tennessee, Kentucky and Ohio. Not more than 5 per cent of the 3,929,214 total population lived west of the Alleghany watershed. The front wave of the people extended almost uniformly along the eastern slope of the mountains, throwing out long arms along the four routes to the West. The average distance of the people from the ocean was not more than 250 miles. The Americans were still coast dwellers. The West was as yet unknown. The most thickly settled portions lay in an irregular line from Portsmouth, N. H., to Baltimore, Md. Here dwelt more than 60 people to the square mile.

The westward advance, as suggested heretofore, was hindered constantly by the hostility of the savages. Perforce the national government was gradually given control of them by the States. It recognized them as foreigners so far as making treaties with them for the possession of their land was concerned. Scores of these treaties were made, establishing lines beyond which the whites solemnly promised not to migrate and east of which the Indian agreed not to molest the white. But it was impossible for the government to restrain the land-hunger of the citizen when confronted by a savage. On the frontier, treaties were secondary to force. These broken and obsolete Indian treaty lines, from which the savages were driven back, bear a striking resemblance to the positions occupied at different decades by the foremost line of the pioneers. In order to provide for the unstayable advance of population, increased constantly in numbers by immigration from Europe, the national government was convinced that something like a general policy of treating with the Indians must be formulated. The whites sometimes surrounded the Indian lands, threatening to annihilate the savages, if they did not move on. Thus in 1820, the advance line of pioneers extended from Kentucky in a strong belt down through Tennessee and western Alabama to Louisiana; but between these people and their brethren in South Carolina and Georgia lay hundreds of miles occupied only by the savage Creeks and Cherokees. Toward the north, civilization had spread up from the Ohio River about to the latitude of Vincennes and Saint Louis, but further advance was barred by the Pottawatomies. With difficulty the whites were kept from annihilating whole tribes. Peace and preservation for the Indian as well as for the white could be secured only by keeping the

former well in advance of civilization, assigning them to some remote portion of the country which they could hold *en bloc*. Here they could dwell perpetually. See TREATIES, INDIAN.

Many Presidential messages, beginning with those of Jefferson, advocated such a disposition of the Indian. In 1839 a revision of the laws regulating trade with the Indians was made. One provision set aside all the land lying to the west of the Mississippi River except the States of Louisiana and Missouri and the Territory of Arkansas to be an "Indian country." Within a few years it received the Creeks, the Seminoles, the Cherokees, Chickasaws, Choctaws and other warlike tribes from east of the Mississippi. Some came willingly, others by compulsion. Incidental to their removal occurred the Seminole War and the Supreme Court case of Worcester v. Georgia. Gradually the "Indian country" was scaled down to the temporary Indian Territory. Released from the barrier of savages, population moved forward more evenly and brought portion after portion of the new lands to statehood. The admission of new States to the Union was made possible by the western movement. So early as Revolutionary days, the number of people pouring across the mountains showed that some provision must be made for governing the land beyond the undisputed limits of the 13 States. It might be held as a tributary province, it might be left to protect itself or it might be nourished by the parent until it reached a stated point and then be admitted to equal rights in free government. In 1780 Congress, wishing to persuade the States having claims on the "back lands" to yield them, promised that it would not hold land entrusted to it as subject territory, but would erect it into States of moderate size as rapidly as population should warrant. This promise had the desired effect and has been redeemed 32 times by the national government. With the exception of Maine, created from a Massachusetts Bay province; Vermont, claimed by several adjacent States, and Florida, purchased from Spain, the new States have been created uniformly on the western side of the old 13 and have been due entirely to the western migration across the continent. New accessions of territory brought land for these new States. The additions of Louisiana, the Floridas, Texas, California and Oregon have come from the movement and demand of the people. The invariable condition of these acquisitions has been that trade allures the American into a neighboring foreign possession. He becomes involved with the authorities, or friction ensues in some other way, and he then demands that his flag shall follow and protect him. Trade never follows the flag, but trade demands that the flag shall follow and protect it. By means of these additions the people have spread over a territory 10 times that of the original 13 States.

It is evident that the front line of people will always be at right angles to the direction of movement, representing, as it does, the foremost wave of advance. This is the "frontier." Technically it is the long, narrow, advanced strip which contains more than two people and less than six people to the square mile. The latest aspect of the frontier is associated with the Great Plains and cowboys; but the frontier in past times has occupied successive positions from the Alleghanies westward at each succeeding census. Its various positions remind one of the old sea beaches on a geological map. When young Andrew Jackson migrated to Tennessee and lodged in the "lean-to" of Mrs. Donelson, built against her log cabin, he was on the frontier of that day. When Abraham Lincoln's mother died 18 miles from a physician in a southern Indiana cabin, it marked the hardships of the frontier. When "border ruffians" contested with "Thayerites" for the possession of eastern Kansas, the frontier had reached that point.

Manifestly, if the start had been equal all along the line and the rate of progress equal, the frontier line would have been almost a straight line. But the topography of the land and the hostility of the Indians prevented such a regular advance. Long arms of people ran up the streams, islands of people were formed far in advance and deep indentations frequently resulted from some hindrance. The frontier of 1830, for example, extended in a great convex westwardly curve from Detroit, Mich., to New Orleans. It threw out so many projections along the Wabash, the Illinois, the Mississippi, the Missouri, Arkansas and Red rivers that it was 5,300 miles long. Ten years later it had filled out these inequalities so much that although it extended from Green Bay, Wis., to Corpus Christi, Tex., it was only 3,300 miles in length.

No prediction could be safely made as to direction or rate of motion. A rush or "boom" would make a fully populated region out of what was yesterday an untenanted wilderness. The census of 1830 showed a barren sweep about the head of Lake Michigan with less than two white men to the square mile except in the lead mines in northern Illinois and a group about Kalamazoo, in southern Michigan. Ten years later the lake was skirted from north of Milwaukee far down into Indiana by from 6 to 18 people to the square mile. Within the decade, it had leaped through the intermediary stage of the frontier. In 1830 Mississippi was settled only in a narrow strip across the southern part. Ten years later the entire State, except a spot near the Gulf, was covered with a population in many places of 20 people to the square mile.

The frontier in 1860 lay almost due north and south just west of Iowa and Missouri. It was the line-up for the final dash across the Great Plains, the best known and most picturesque of all the positions of the frontier. In 1890 it had assumed its highest achievement and was in its proudest position. Beginning at the Canadian border near longitude 100° it came down through the Dakotas and suddenly turned westwardly, encompassing the larger part of Colorado, and rounding down into Texas on the south. But 10 years later, population had so shrunken in the "dry farming" districts of Nebraska, Kansas and Colorado, that the line had fallen back, almost coincident with the meridian of 101° west longitude from the Canadian boundary to the Rio Grande. For the first time in its history, the American frontier had retreated. Nature, driven back step by step through the conquering will and forces of men, seemed to have taken her stand in the arid regions and to defy further encroach-

ments upon her realm. National irrigation under the form of internal improvement is now the weapon with which she will again be overcome.

The movement of population, which conquered the continent and unified the American people, was not only a westward movement but a due west movement. Men follow parallels of latitude because of similarity of climate, occupation, products, foods and dress. The constant tendency to migrate due west is shown in a study of Americans living in one State who were born in another. New York, to illustrate, has contributed more citizens to New Jersey than to any other State; then to Michigan, Pennsylvania and Illinois in decreasing order, but all to the westward. Georgia has sent more of her citizens to Alabama than to any other State; then to Texas, Florida, Tennessee, Arkansas and Mississippi, in decreasing ratio. Arkansas and Iowa are about equally distant from the Atlantic, the place of setting out. But in the onward march, 26 New Yorkers found their way to Iowa for every one to Arkansas. On the other hand 57 South Carolinians have chosen to live in Arkansas for every one who chose to remove to Iowa. The State of Washington has drawn most largely upon Illinois and Texas most heavily upon Tennessee. All this had a most important bearing on Northern and Southern sectionalism.

The due west movement has been accompanied thus far by a very slight return movement, except beyond the Rocky Mountains, where the entire migration is the reverse of that to the east of the continental divide. Thus Virginia has given to Missouri 35 citizens for one received in return. But with the exhaustion of the western public lands, the growth of cities and increased means of communication, the westward movement will gradually wane. As evidence of this, it may be noted that in 1880 Illinois had given to Iowa six persons for one received, but in 1900 the ratio had fallen to three to one. During the same period, the ratio of exchange between New York and Colorado had fallen from 75 to 1 to 22 to 1.

This return movement will be increased by the improved methods of applying steam and electricity to means of transportation. Mention has been made of the increased rate of motion owing to these and similar improvements. The waterways were the ready-made highways for the pioneers. Supplemented by carrying or portage paths from stream to stream or across watersheds, they formed a network of routes of travel, not only in a drainage basin, but from basin to basin. No small amount of the proverbial American "initiative," the capacity for doing things, must be attributed to the manner in which obstacles were overcome in this primitive travel and transportation.

The American frontier has passed forever. Fully equipped civilization stands at the edge of the arid region. It is met in the mining cities of the Rockies. The American pioneer lives only in the gratitude of the people. The influence which the frontier and frontiersman have wrought on American life have been suggested frequently in preceding pages of this article. A supplemental summary finds that the frontier has produced (1) a constant renaissance of the principles of free government upon which the republic was founded. Western State constitutions have been notedly more liberal than those of the Eastern States. Eastern statesman have been rejuvenated by contact with the crude sons of the West. A jealousy of their republican institutions, amounting almost to a madness, permeates the Western people, sometimes making them liable to harbor political and economic vagaries. (2) The frontier has helped keep alive the principles of democracy in America, notwithstanding the enormous accumulations of riches which tend naturally toward begetting social distinctions. Among the frontiersmen personal strength and personal merit outweigh descent and social rank, (3) The needs of the people in the remote regions, met by Congress under the general name of "public improvements," have tended constantly to widen the scope of the national government. The scruples of "strict construction" must give way before the clamor of the people, as Clay easily demonstrated. (4) The public domain, by the easy arrangement of purchase, has furnished farms and homes for millions of immigrants, who would otherwise have crowded into the cities to become consumers of food, but who, as agriculturalists, have become producers of food. (5) The missionary spirit has been kept alive by the needs of both savage and civilized man along the border. Frequently colonies were transplanted to the wilds, carrying churches, schools and even colleges with them. Galesburg, Ill., and Granville, Ohio, are examples. (6) The vacant land in the West has offered an asylum for theorists and philanthropists. The Mormons, the Icarians, the Harmonists and the community at Greeley, Colo., are instances of this kind. (7) Guarding the frontier has furnished a *raison d'être* for maintaining a small force of national troops until such time as the growth of cities furnishes a new task. The deeds of daring performed by both rangers and regulars along the border will be handed down among American traditions. (8) Free education has been fostered through the provision for granting a certain portion of the public lands for public schools and for colleges. (9) The tillable land of the West has made us independent of other nations and has largely turned their dependence for food supply on America. In a similar manner, the western mountains have furnished a mineral supply for the manufacturing demands of the older portion. Cities and villages have cut down materially the food-producing area in the older States, but the West is still unhampered. Excluding Alaska and the other outlying possessions, the centre of area of the United States is in northern Kansas, but the centre of population is in central Indiana, more than 700 miles behind.

"The West" has always been a purely relative term and so remains. To the New Englander, it means New York or Ohio. To the people of those States it means the trans-Mississippi region. In Utah, it means California. In 1832 Chicago was in the Far West. About that date, a man conceived the idea of killing hogs, packing them in barrels with salt, and shipping the pork by lake to Detroit and Buffalo, instead of driving the animals on foot or shipping them by boat, as was the practice. By the end of the century, Chicago was "packing" 2,000,000 cattle annually and 7,000,000 hogs, sending the meat in refrigerator cars to supply

the hungry Eastern States and Europe. As early as 1830 a long, thin projection of people ran up the Missouri River to the mouth of the Kansas, following the route of Lewis and Clark a few years before. It was prophetic of the future collecting and distributing point of Kansas City, 1,500 miles from the starting points along the Atlantic.

So long as wagon trains toiled over prairie trails, or pony expresses handled light packages and the mails, or the overland coach carried a limited number of travelers, the resources and capacities of the great West remained untried. But, in 1862, two companies accepted the offer made by the national government of land and loans to construct a continuous railway from the Missouri to the Pacific. Precedent for this assistance of the government was found in the custom of granting certain portions of the domain for constructing means of access, thereby rendering the remaining land more valuable. In 1869 the line was opened and it sounded the death knell of an isolated West. When the road was begun, there were only 14,916 miles of railway beyond the Mississippi. When it was completed, there were 22,863 miles in operation in that remote region.

The Great American Desert, as our fathers mistakenly called the Great Plains, is now fretted over with railway lines. In its midst lies Kansas, Nebraska and the Dakotas, among the largest corn and wheat producing States. West of the Mississippi lie Texas, Montana, Oregon and New Mexico, containing more sheep than the remaining States combined. West of the Mississippi lie California, Idaho and Colorado, producing more precious metals than all the remaining States. Most of the manufacturing is still carried on east of the Mississippi. Likewise a majority of the people dwell on the eastern side. But the river, running north and south, is no longer a menace to the perpetuation of the republic as it once was. Migration and trade run east and west, and the great Father of Waters is spanned by more than a score of railway bridges, linking the people together along modern lines of transportation. These trunk lines bind together the East and West, the old and the new, sire and sons, manufactures and raw products, storehouses and grain fields. Home ties are no longer sundered by migration; sectionalism is no longer begotten of distance; and the people move freely to and fro over soil which their forebears wrested from nature in order that the experiment of a confederated republic might be tried on the largest scale yet attempted.

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24. THE NEW DEMOCRACY AND THE SPOILS SYSTEM. The use of the appointing power to secure, in addition to the execution of the functions attached to the various offices, other purposes such as the enrichment of one's family, the building up of personal or party support, the carrying out of some general policy, is as old as government, is probably inherent in government. The term spoils system in United States history is more definite than this. It is generally used to refer to a particular method of employing this power which was introduced into national politics at the time of Jackson's Presidency, and which from that time until the eighty's was, after the Constitution, the most important feature of American political machinery. Few important movements in our history have secured their first triumphs in the national government. The spoils system had long been tried out in various States before it became national. In Pennsylvania in 1799, in New York in 1801, Republican victories had been followed by the wholesale removal of Federalists. The swiftly succeeding party changes brought retaliations, and both parties were soon committed to the practice. Popular approbation confirmed it, and popular apathy allowed appointments to be made more and more exclusively for political reasons. The New York constitution of 1820 embodied an attempt at reform. The spoils system was, however, too firmly intrenched to yield, and the Albany Regency, a combination of politicians skilful in making use of appointive offices for political purposes, and in controlling the minor elective offices by means of caucuses, became the dominant power in the State. The advantages of the spoils system in building up and holding together a political organization did not escape the attention of politicians of other States. Proscriptions were carried out in Rhode Island in 1810, in Massachusetts in 1813, and, while they were unpopular and did not lead to a permanent introduction of the spoils system there, they indicate that in these States, and probably in others, there existed a class anxious to see the public offices turned over to the politicians. Debarred from using the State service for their purposes, such men naturally looked to the national salaries; nor in this were they alone. The more fortunate politicians of New York and Pennsylvania had already a little tinged with politics the national service in their States, but they would not rest satisfied until they could elect to the Presidency a man who approved their principles and would make the spoils system national. The existing state of affairs was displeasing not to the politicians only, but to the people, particularly those of the frontier States. The

wholesome distrust of life-tenure in executive and legislative office, which had been so keen during the Revolutionary period, had extended to administrative office; the reasons for regulation had been forgotten and limitation had come to be considered as an end in itself. State constitutions and laws began to substitute a fixed term for tenure during «pleasure» or «good behavior,» and in 1820 Congress limited to four years the tenure of the majority of United States officials. Such legislative action did not immediately lead, and was not intended to lead to, actual change; it was to give the people the power to make such change, if necessary. In 1828 there was a popular feeling that the time had come. The long tenure, and in some cases too eminent respectability, the book learning, of the existing servants of the people, had made them for some time feared and distrusted. In this situation the charge of «bargain and corruption» against Adams and Clay seemed proof positive: the case against the civil service was complete. Joined to this distrust of those in authority was a superb confidence in the honesty and capacity of the people. Jackson said in his first annual message: «The duties of all public offices are, or at least admit of being made, so plain and simple that men of intelligence may readily qualify themselves for their performance; and I cannot but believe that more is lost by the long continuance of men in office than is generally to be gained by their experience.» The frontier did not believe in the expert; the typical American was a «Jack of all trades.»

Jackson Introduces the Spoils System.— The election of Jackson was brought about by the combination of these two elements. Van Buren had brought the support of the organized Democracy of the North and East, of the politicians and the people that they represented. Jackson himself stood for the frontier democracy, with its confidence in itself and distrust of those it did not understand. The enormous crowd of office-seekers at Washington on 4 March 1829 left no doubt as to what course the government was expected to pursue. It is useless to discuss the personal responsibility of Jackson and Van Buren for the subsequent course of the administration. They were but carrying out a policy in which they believed and which the people had elected them to put into effect.

Of 610 officers of the Presidential class, that is, those appointed by the President with the advice and consent of the Senate, 252 were removed during Jackson's administration. This number is not large, but there are facts which make this proscription the most noteworthy in our history. The majority of the removals were made in the spring and summer of 1829 and so attracted more attention than those of Jefferson, which were scattered through several years. Among those changed, moreover, were included nearly all the important officers, many of whom controlled large numbers of subordinates and carried on proscriptions of their own. In addition, the removals were to some extent localized, for few were made in the old South. In the North and West, then, by far the greater proportions of the salaries and influence of the national service changed hands. The specially distinguishing feature of this proscription, however, was the nature of the qualifications for office demanded. Up to this time, ability to perform the duties of the office, geographical fitness, good local standing and political opinions in sympathy with the appointing power had been required with varying emphasis. Service to the party was sometimes rewarded, but incidentally, at no time being actually essential. Under Jackson, ability became incidental, and party service the main requirement, not only past service but future usefulness as well. Newspapers were then not generally self-supporting and many editors received offices to enable them to pay their debts and improve their papers. Nor was loyalty to party alone sufficient. Unless one were a friend of Jackson or could obtain his ear, it was decidedly advantageous to belong to the Calhoun faction, and have his friend, Gen. Duff Green, editor of the *United States Telegraph,* press one's suit; or to advocate the succession of Van Buren and receive the aid of the powerful interests he represented. By 1831 the salaries of office-holders were occasionally assessed for party purposes, and, by the close of the administration, this practice was well recognized. The spoils system had been introduced into the national service: the question of its continuance remained.

The Whigs Establish the Spoils System. — The opponents of Jackson seized upon his administration of the civil service with avidity. They could not conceive that the people would endorse a practice that appeared so impolitic and wasteful. The Senate did not reject many of his nominations, but in 1831 several resolutions were introduced to show its disapproval and in 1835 an elaborate plan to regulate the control of the patronage was formulated. Webster, Clay, White and Calhoun delivered able speeches filled with high ideals of public service. When examined, however, the plan proposed is found to be purely an attempt to limit the power of the executive. The President was to present to the Senate the reasons for removals. Jackson refused to yield. His friends defeated the Senate's proposal, those whose nominations were rejected received compensation in other ways, and on 10 Feb. 1835 he peremptorily refused to send to the Senate any information concerning the removal of Gideon Fitz, asserting that that body had no right whatsoever to investigate removals. While no tangible results were obtained by this senatorial opposition, the patronage was to play a prominent part in the campaign of 1840. The crisis of 1837 struck a staggering blow at the civil service. Public servants who had speculated with government funds were caught without property to pay their loans: of 67 land officers, 64 were said to have been at one time in default. This condition was partly due to downright dishonesty, as in the case of a Samuel Swartwort, collector at New York; more, and especially in the West, to lack of business education. A treasury agent wrote of «a certain looseness in the code of morality, which here does not move in so limited a circle as it does with us at home.» Some such experience was inevitable in so great a crisis. Its extent was due to the carelessness with which appointments had been made, and the Van Buren administration suffered as if alone responsible

for the spoils system and the breakdown in the civil service. Reform became one of the most popular issues of the campaign, and the method of dealing with the situation proposed by the Whigs, the limiting of the power of the executive, was one that appealed strongly to their Southern States rights supporters. To nothing did the election of Harrison so strongly commit his party as to the abolition of the spoils system. Having come into power, they failed to enact their legislation planned in 1835, although in full control of Congress, and although the subject was brought up. To remove many of the incumbent officers was necessary to their reform, but in filling the vacancies thus created they were pledged to return to the pre-Jacksonian qualifications for office. Instead, while insisting upon ability somewhat more than Jackson had done, they continued to make party service the chief essential. The man appointed collector at New York was described to Peter B. Porter by Thurlow Weed as follows: "Although not personally popular, [he] is represented as possessing an extraordinary share of tact or stratagem, and as being able, by his skill in planning and combining, and his untiring industry in executing, to produce the most astonishing political results. That, with the office of collector [which Weed considered as second only in importance to that of Postmaster General] he could on all important occasions, command the vote of the City of New York, and, per consequence, of the State." In 1841, then, the spoils system had been recognized by both parties and might be considered established.

The Significance of the Spoils System.— The continuous progress of the spoils system from a few States to the nation, from the nation into other States, from one party to the other, until it became a thoroughly national institution, indicates that it possessed some principle of vitality. The reasons thus far offered are insufficient to explain its growth. No practice could become so firmly fixed unless it served some fundamental lasting use. The spoils system was in fact a concomitant and probably a necessary one, of the democratic revolution which made Jackson President in 1829 and established the rule of the people in the United States. The people cannot govern unless organized. They may overthrow old leaders in a revolution, they may elect new leaders by a plebiscite, they may even determine the policy of the government in moments of great national enthusiasm, but they cannot exert a steady control of the details of adminstration unless their lagging interest is kept up and their views given a means of expression by organization. Organization, however, requires leaders, not only leaders of ten thousands, who receive a reward of glory, but humble leaders of tens, ward-heelers, who enjoy little honor. Public interest attracts some to perform this function, but a sensitive democracy requires that these men shall be of the "people," not men of wealth; it would not have politics a business of class, as it largely is in England. Now, however public-spirited a poor man is, he has to earn a living. Such motives, moreover, would not attract a sufficient number. Material inducements are necessary and some substantial means of supporting party organization must be found. To supply this is the function of the spoils system. The civil list becomes the pay-roll of the party and the recipients of public salaries are expected to serve the nation in the double capacity of working officials and party organizers. The rise of the spoils system was, then, inextricably joined with the rise of party organization and of democratic government and this connection has continued to the present day (1916), although it has ceased, since the 80's, to be the controlling factor in national politics and in most localities.

The Struggle for the Patronage.— It follows from this inter-relation of the spoils system and party organization that the control of the patronage would often mean control of the party. Hence the struggle to secure this control became very bitter, and raged not merely between the two parties but also between the different branches of the government. The Constitution gives the House of Representatives no share whatsoever in the appointing power. In 1826, however, it was proposed that the delegations select the newspapers to be given the printing of the laws. In 1862 each member was allowed the appointment of two cadets at Annapolis and in 1899 General Grosvenor proposed that all government offices be divided equally among the Congressional districts and that the recommendations of the congressmen be requisite for appointment. The Senate, on the other hand, possesses rights under the Constitution and has always fought to have them respected. In 1789 Congress decided that the Senate had no power over removals. This interpretation was continually attacked, but for a long time unsuccessfully. The House of Representatives did not sympathize and a two-thirds majority would be necessary to override the almost inevitable veto of the President. Under Johnson, however, circumstances were favorable. The executive power had grown abnormal during the war; the patronage had become so extensive that it was feared even before the death of Lincoln; the actual President was hated, and his opponents had a two-thirds majority. In 1867 the Tenure of Office Act was passed, providing that Presidential officers could be removed only with the advice and consent of the Senate. The friends of President Grant procured the modification of this act in 1869, but, in spite of protests and with little to say in its defense, the Senate maintained the law until 1887, when finally it was repealed and the interpretation of 1789 restored.

The Machinery of the Spoils System.— While legally the President has maintained his power except for this short period, in actual practice he has long been greatly restricted. It is of course impossible for him to be personally cognizant of the conditions and the qualifications of candidates for all the positions scattered over the country. Assistance has always been necessary and it has been natural to consult the members of Congress best acquainted with the locality. This was done from the foundation of the government, but, with the development of the spoils system, the requests for advice became more a matter of routine and the obligation to accept it became more binding; the discretion of the central government became a smaller factor. All representatives in sympathy with the party in power began to expect as a matter of course to control the appoint-

ment of minor officers, as rural postmasters, within their districts. Lincoln's correspondence shows that in 1849 he considered this a well-established rule, and as President he abided by it. Often courtesy extends this privilege to congressmen of an opposing party, notably to those from the South, and in cases where a fixed number of new offices is created for every Congressional district, as in the census appointments for 1900. With regard to all local offices of the Presidential class, the senators from the State in question expect to be consulted. In the early history of the spoils system, the delegations composed of all members of Congress from the several States settled such questions; under Pierce, they dictated nearly all important appointments. Lincoln wrote that the two Rhode Island senators, the two old representatives, and one of the new ones, combined in favor of one candidate, and added: "While under peculiar circumstances a single member or two may be overruled, I believe as strong a combination as the present never has been." After the passage of the Tenure of Office Act, the senators waxed in power at the expense of the representatives, their assumption reaching its height when Conkling and Platt in 1881 retired from the Senate because they were not allowed to control the New York appointments. The repeal of this law, however, has not restored the delegation to its former position; "Senatorial courtesy" still gives a senator a practical veto on appointments from his State, as the other senators, disregarding party lines, will generally vote with him against a nominee whom he considers personally objectionable. General and foreign appointments are often times divided pro rata among the States and assigned in the same way as the local offices. This was understood in 1849, was a fixed rule under Pierce and has been the general practice ever since. The extension of the influence of members of Congress curtailed that of the secretaries of departments, and the limits of their respective powers have always been a source of difficulty. Under Pierce, it seems to have been the practice to allow the secretary at least a nominal veto on all nominations to offices within his department. Lincoln was inclined at first to overlook this, and had much difficulty with Secretary Chase in regard to it. The personality of the secretary has much to do with his influence, but few of them exert very much at present, except as advisers of the President. The latter dispenses comparatively little patronage directly, but as the final arbiter in disputes between senators and representatives, holding in his hands the whole situation and adjusting the various interests, he has a power which makes even a weak man powerful and a strong man party dictator. The boss exerts his influence through some of these agencies: as the friend of the President, as a member of Congress or as the political mentor of congressmen. The whole is now highly systematized; the Treasury Department can tell in a moment by its card catalogue how many men every congressman has recommended, how many have been appointed and what congressman recommended every appointive officer.

The Spoils System and Administration.— The spoils system does not necessarily mean bad administration. Its uncertainties deter men of conservative tendencies from entering government employ; but the opportunities of sudden and distinguished advancement attract men of adventurous character, and undoubtedly so far in our history this latter class has contained the greater part of the ability of the nation. It is not to be supposed, moreover, that the whole service has ever been changed at any single proscription. William Hunter entered the State Department in 1829 and served until 1886, preserving the continuity of tradition and becoming a power in the State by reason of his experience. He is a type of a large class of permanent officials, who have on their shoulders the weight of routine business. Often it is easy to distinguish between two distinct classes of officers, the one working at government duties and the other attending to politics. Of course this double system is expensive, because of the unnecessary number employed and the fact that the class of men attracted while able are not always honest; but it need not be inefficient.

Rotation in Office.— While the rise of the spoils system is so closely connected with the rise of the new democracy, and its organization was soon completed, there are several significant episodes in its later history. The system had been justified before the public largely by the democratical phrase "rotation in office." For a long time, however, actual rotation was practised only when the incoming President belonged to a different party from his predecessor. Buchanan was the first President to expel men of his own party. It was then held that the public offices were prizes, and that democracy demanded that they be shared round as often as possible, that no one should hold longer than four years. Consistency required that a President who was re-elected decapitate his own appointees, and this policy was urged on Lincoln in 1865. He firmly set his face against the suggestion, and it has never been carried out. Buchanan's example, however, was followed until Roosevelt succeeded McKinley.

The Spoils System and the South.— The seaboard South was for a long time comparatively free from the spoils system. Jefferson stated, not quite truly, that he had no requests for removals from that region. The dislike for the New York machine did much to promote the formation of the Whig party there, and Calhoun was not more emphatic in his support of slavery than in his demand for reform in politics. This immunity was largely due to the political conditions, the fact that politics was the business of the wealthy and that the public offices were not needed to support party organization. The Civil War and Reconstruction brought a total change. The attempt to build up a stable Republican organization composed of moneyless negroes and money-seeking white men from the North involved necessarily the use of public offices, both State and national, as spoils. After the overthrow of the negro domination, this organization was still maintained by the use of the national spoils, because of the votes it could cast in national nominating conventions. In the Democratic party, the wealthier class gradually lost its control, and the rise of a real democracy has been again marked by the adoption of the spoils system, which may be said now to embrace the whole country.

The Spoils System and Civil Service Reform.— At the very time that the spoils system was being extended into the South, it received a vigorous attack in the development of civil service reform. It was natural that such a movement should come when the Civil War had so greatly distended the civil service. The method of reform proposed was the substitution of a mechanical for a personal method of appointment. It was claimed by the supporters of the status quo that no mechanical system could be devised which could properly take into account a man's ability to perform the functions of his office. The reformers claimed that such a system was possible, that offices must be withdrawn from politics and that this could be done only by eliminating the personal element. The conduct of private business was improving and the expert was beginning to play his part as the life of the nation became at the same time more complex and more orderly. In 1883, after an earnest crusade, Congress voted that the experiment be made. The law has received the support, more or less earnest, of every President since that time, and has been extended, officially or by practice, to include the greater number of officers in the national civil service. In fact since the inclusion of the fourth class postmasters by Taft, and the virtual inclusion of the consular service by Wilson, comparatively few offices remain which could properly be placed under the mechanical system of selection. Most State and city governments, moreover, have followed the national example. Not that the spoils system has vanished. The pressure on those portions of the service not covered by the law has increased, and the law is often circumvented. Nevertheless the bulk of our public servants are as secure in their positions as are those in private life, and their only political obligation is to refrain from political activity, not to exert themselves in it. The public service, moreover, is conducted with a reasonably high degree of efficiency.

It should not be overlooked, however, that the problem of which the spoils system was a crude and dangerous solution has not yet been satisfactorily solved. In fact just when the offices first began to be withdrawn from politics the expenses of party organization greatly increased. The necessary funds were furnished in large measure by the campaign contributions of great corporations and powerful individuals interested in securing or defeating legislation. This is one of the fundamental explanations of the course of politics in the '80s, '90s and the early 20th century. Meantime all other methods have been evolved, as the statutory limitation of campaign expenses and the taking over of party primaries, with the consequent expense, by the government, while widespread popular contributions and publicity of expenses have decreased the importance of the individual subscribers. At present all these methods are employed, and party control has become less concentrated. It is still uncertain what the final method by which democracy will maintain control without too seriously interfering with the efficiency of administration will be.

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25. ANNEXATION OF TEXAS. The Louisiana Purchase in 1803 gave the United States a shadowy claim to Texas. This claim was strengthened by each succeeding administration until 1819, when all rights beyond the river Sabine were given up as a consideration to Spain for the cession of the Floridas. Between 1820 and 1830 great numbers of Americans settled in central Texas; most of these were from the Southern States, and they had carried their slaves with them. An arbitrary union in 1824 of this semi-Anglo-Saxon region to the Spanish state of Coahuila gave rise to much dissatisfaction; the abolition of slavery throughout the newly-established Mexican republic in 1829 increased the discontent of the thrifty Texan slaveholders; but when, in 1830, the Mexican government forbade citizens of the United States to settle within the discontented region and placed the country under military control, the Texans demanded (1833) complete separation from Coahuila and an independent existence in the Mexican confederation. This was refused and a still closer surveillance was established by Santa Anna in 1834. Two years later the Texans issued their declaration of independence and set up a government of their own. The fact that only two of the leaders of this movement were not American settlers is proof enough as to one cause of the conflict. Santa Anna attempted to put down the revolt; he failed disastrously. At San Jacinto, in northeastern Texas, April 1836, the insurgents defeated the Mexicans and either killed or captured their entire army. A constitution was now agreed upon and the republic of Texas firmly established. It is significant that the constitution provided expressly for the re-establishment of slavery, which had been maintained contrary to law since 1829. The boundaries of the new State were declared to be the Rio Grande on the southwest and the Sabine, Red and Arkansas rivers — the line of 1819 — on the north and northeast. These boundaries gave Texas a total area of 270,000 square miles — a territory equivalent to five of the larger States of the American Union. Gen. Sam Houston, the hero of San Jacinto, became the first President of the Texan Republic. The government thus founded was in its essential features a copy of that of the United States. Texas was recognized at once by the United States as an independent nation, and the powers of Europe followed suit in a few years.

Texas made application for admission into the American Union in August 1837. President Van Buren opposed the proposition and eight States made formal protest against annexation. But as early as May 1836, one month after the battle of San Jacinto, John C. Calhoun had declared from his seat in the Senate that an independent power between the United States and Mexico was inadmissible; be favored immediate annexation, and, as he openly declared, on the ground of the extension of slavery. Calhoun represented the South, and the South since 1830 had become more firmly anchored in slavery than ever. The States of Virginia, Maryland and the Carolinas exported not less than 50,000 slaves a year to the Far South and Southwest. An active propaganda favoring annexation immediately began; legislatures of most of the slave-holding States passed resolutions calling for annexation. Even the great influence of ex-President Jackson was given to the cause. But the Whig party won the election of 1840, and the Whigs, more a Northern than a Southern party, opposed annexation. In order to "carry" the important State of Virginia, which was already States-rights and pro-annexation in political complexion, John Tyler had been placed on the ticket with Harrison. Tyler, a Whig because of Jackson's high-handed methods rather than from principle, was a States-rights devotee, a slaveholder and a determined annexationist; he became President on the decease of Harrison in April 1841. In 1842 the Texans again knocked at the door of the Union. It would have been opened to them but for the opposition of Webster, the Secretary of State. Next year Webster resigned and Abel P. Upshur of Virginia was appointed to fill the vacancy. The new secretary belonged to the extreme States-rights school of politicians. The Cabinet, which had been reformed in 1842, was now in accord with the executive. Annexation became at once the main business of the administration. In October 1843 Upshur informed the Texan representative in Washington that a renewal of overtures for annexation would be welcome. Van Zandt asked for the requisite powers, but meanwhile the influence of the abolitionists had reached Texas and a sharp contest was waging there about the question of slavery. The pro-slavery party, both in Texas and the United States, suspected English intrigue. A speech of Lord Aberdeen's in Parliament gave some color to this suspicion. The administration inquired of the English Cabinet the cause of the rumors circulating in Texas and the South and received a complete disavowal of any aim or intention on the part of the English government to interfere in any way with the affairs of the new republic. Still other influences had come into play: Texas had learned to stand alone; an armistice had been arranged with Mexico; a definite peace seemed more than probable. Houston and the other leaders of Texas had lost their former enthusiasm for annexation. The wooing was now to come from the other side. The slave States of the United States became uneasy; the vast and fertile area of Texas seemed about to be lost to their cause; failure to act promptly had been the fatal cause, and now fear of war with Mexico gave the final motive to Texas for remaining out of the Union. The outlook was not quite so dismal as it seemed; the Texans inquired of Upshur, in January 1844, whether the United States would protect them against Mexico while the proposed negotiations were pending, for it was known to all that much difficulty and delay would be put in the way of annexation by the Whig party in the United States Senate. The Secretary of State did not answer this question, but his agents in Texas let it be known that protection would be guaranteed. The way was again open and negotiations now began in earnest. Upshur was killed, on 28 Feb. 1844, by the explosion of a gun on board the warship *Princeton*. Tyler called John C. Calhoun, the first great mover of the annexation scheme, to the office thus made vacant. Calhoun accepted the State portfolio with the single purpose of finishing the work he had begun eight years before. The treaty was speedily concluded and ratified by the representatives of both countries. On 22 April 1844 it was sent to the Senate. The issue was now clearly drawn and the country immediately divided: Calhoun, sustained by the unanimous voice of the Southern States, asked for immediate annexation; the Whigs, except its Southern wing, followed by the great majority of the North, denied the request.

Meanwhile, another issue had been preparing. For many years the vast Oregon region had been held jointly by Great Britain and the United States. This territory extended from northern Texas to the 54th parallel of north latitude. Both England and the United States had claims on Oregon, and these claims had been mutually recognized, but the people of the West, always ready for growth and expansion and not given to quibbling over constitutional limitations, were rapidly coming to demand the whole of Oregon. Calhoun saw the importance of the Oregon question; he recommended that the Democratic party couple it with the Texas question, though he did not favor the extreme demands of the Westerners. The Southern Democrats seized the opportunity, and co-operating with the expansionists of the West, they began a campaign for the control of the Democratic national convention, which was to meet in Baltimore. The editor of the Richmond *Enquirer* was a typical leader of this movement. A letter of ex-President Jackson, written a year before, was now published in the *Enquirer*, bearing date of 1844. The Nestor of the party urged annexation. When the convention met it set aside at once Jackson's favorite, and the ablest Northern candidate, Van Buren, and nominated James K. Polk, an avowed "Texas man." The platform demanded the immediate "re-annexation of Texas and the re-occupation of Oregon." "Fifty-four or fight" became the party cry of the West, while the leaders of the South boldly threatened secession in case Texas was not annexed. Meanwhile, the Senate rejected the Texas treaty by a majority of 35 to 16, and the leaders of the Whig party, aided by the dissatisfied followers of Van Buren, exerted their influence to the utmost to get the country to sustain the Senate majority. They failed by a narrow margin and Polk became the next President. Tyler and Calhoun, falling back on a popular Democratic doctrine, considered themselves and Congress "instructed" by the country to

proceed with their work. Since the Senate held out stubbornly against them they resorted to the plan of accepting Texas by joint resolution, a method hardly justified by the Constitution. This required a majority only of both Houses, while the passage of a treaty in regular form required two-thirds. The joint resolution passed, and on 3 March 1845 annexation was complete, so far as the United States was concerned. Texas approved the treaty without questioning its legality in June 1845, and in July of the same year the people of the Lone Star State, in convention assembled, ratified the work of their representatives by an almost unanimous consent.

Texas came into the Union with a quarrel on its hands: Both the Mexican and Texas governments claimed the country lying between the Nueces and the Rio Grande. This and all other subjects of dispute between these governments seemed about to be amicably arranged in the early months of 1845, on condition, however, that Texas should not permit annexation to the United States. Mexico had repeatedly declared that annexation would be regarded as a declaration of war. When the joint resolution passed Congress the Mexican Minister in Washington asked for his passports and the American representative in Mexico was unceremoniously dismissed. The United States had already sent troops into the disputed country; a year later they advanced under General Taylor to the Rio Grande and trained their guns on the Mexican town of Matamoras. War followed. Texas had been obtained at the behest of a Southern party and for the purpose of a make-weight against the expansion of the free States toward the Northwest. The leaders of Texas had come into the Union to safeguard slavery against the free labor and abolitionist sentiment of the great outside world. This had not been done without the promise of the "re-occupation" of Oregon, which gained the votes of the West and North. But the able, aggressive and uncompromising policy of Calhoun and his section had aroused the North; the abolitionists became politically important, and the issue which followed terminated in civil war. See TEXAS; MEXICAN WAR.

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26. THE ABOLITION AND FREE SOIL MOVEMENTS. The first important and concerted movement in America for giving freedom to the slave began with Quakers. Their persistent opposition to human slavery arose from the nature of their doctrines. Even before the American Revolution, individual Quakers like John Woolman of Philadelphia raised their voices in favor of emancipation. The emphasis placed upon the rights of man, in the Revolutionary struggle also strengthened the sentiment in favor of emancipation in all the colonies. As this period drew to a close, no stronger condemnation of slavery was uttered than by Thomas Jefferson, himself a slaveholder, in his famous book called 'Notes on Virginia.' A similar arraignment of the institution was made by George Mason of Virginia, in the Constitutional Convention of 1787. About this time the Northern States were taking steps which ultimately freed them from slavery. New England and Pennsylvania led the way in this movement. The first anti-slavery society in America was formed in Philadelphia in 1780. Benjamin Franklin became one of its members. But this form of opposition was not confined to the Northern States, for both Maryland and Virginia organized anti-slavery societies. The movement in the South, however, did not reach the point of emancipation by State action. The institution of slavery had become firmly riveted on the South, because of climatic and industrial conditions, and the problem of emancipation, therefore, was vastly more difficult than at the North.

In Washington's administration a new and powerful factor was introduced into the problem by the invention of the cotton gin. This machine so cheapened the preparation of cotton for the market that the raising of cotton became the dominant industry of the lower South. The North profited from this new era of cotton development by building cotton factories and in competing with England for the raw cotton of the slaveholding States. Both an American and European demand were placed upon the South for the extension of cotton production. The price of slaves also rose, and the domestic slave trade so increased that the supply seemed to be abundant, although, when the African slave trade was abolished in 1808, many persons had hoped that the result would be the gradual decay of slavery. But they were mistaken. The new industrial and commercial foothold obtained by the institution gave it more favor than before in the eyes of both the North and South. Only the Quakers kept up any serious attack upon it during the first 25 years under the Constitution.

Opposition to slavery had been based, thus far, on all sorts of grounds, and had been carried on in a very moderate and decorous fashion. The Quakers, although attacking the system on moral grounds, did so in a manner comporting with their reputation for moderation. The prolonged and exciting struggle over the admission of Missouri (1819–21), however, turned attention upon the slavery question in a more intense way than ever before. Benjamin Lundy a Quaker, who had already been working to encourage slaveholders to emancipate their slaves, now founded the first important anti-slavery paper, the *Genius of Universal Emancipation* (1821). He published editions of his paper in Ohio, Tennessee and Maryland. In 1829 Lundy called to his aid young William Lloyd Garrison

who became the most fiery and radical of all the early abolitionists. His hard-hitting blows fell upon a New England slave dealer for carrying a cargo of slaves from Baltimore to New Orleans. Garrison was soon in jail, from which he was released by a stranger paying his fine. He now returned to New England and founded in Boston (1831) the most famous of all abolition papers, *The Liberator*. With the aid of a few friends he founded the New England Anti-slavery Society in 1832 with the avowed object of endeavoring "by all means sanctioned by law, humanity, and religion to effect the abolition of slavery in the United States." Similar organizations sprang up in other Northern States, and another anti-slavery paper, the *Emancipator*, was launched in New York City, under the patronage of Arthur Tappan, a philanthropist. These were small beginnings. Only a few men in any community were courageous enough to stem the tide of public disapproval. In 1833 a little group of men and women, gathered from 10 States, met in Philadelphia to establish the American Anti-slavery Society. Among them were Garrison, Samuel J. May, John G. Whittier, William Goodell, Lewis Tappan and Lucretia Mott. In that city not a man was found willing to serve as chairman. For safety they met behind locked and guarded doors and labored at their task throughout the day without venturing to hold an evening session or to be seen on the streets in search of a mid-day lunch. A declaration of principles was issued which showed the unalterable determination of the abolitionists to carry on the agitation against slavery until every slave in America was liberated. Public sentiment was to be aroused by public speakers traveling about the country, by sermons from the pulpit, by appeals from the press wherever possible and by a wider circulation of anti-slavery tracts and periodicals. Headquarters of the new society were set up in New York with Arthur Tappan as president, and with the *Emancipator*, Goodell editor, as their organ. Immediate emancipation was their cry and uncompromising hostilities to slavery their creed. In a few years hundreds of anti-slavery societies had sprung up and more than 500,000 anti-slavery documents been distributed.

The rapid growth of the abolitionists introduced discord and faction. In a short time leaders arose who demanded that abolitionists participate in politics, as a means of forwarding the cause. Some of the old leaders, of whom Garrison was chief, strongly opposed political action, but declared in favor of woman's participation in the work of the anti-slavery societies. The differences between the two parties were augmented by the strong opposition of some Northern clergymen to women taking part in public discussion. The dissensions grew till State and national organizations were disrupted, resulting in two sets of anti-slavery societies and two sets of anti-slavery publications. In 1840 a number of abolition leaders who believed the time for political action had come met at Albany and formed the Liberty party (q.v.). Among the founders of this national party were Myron Holley, Gerrit Smith and James G. Birney. The latter was nominated for the Presidency, and renominated in 1844. In the famous campaign of 1840 he polled about 7,000 votes and in 1844 62,000. Neither of these votes represented the total strength of the abolitionists and certainly not the strength of the anti-slavery sentiment of the country. The rapid rise of the anti-slavery societies which followed the formation of a national organization greatly accelerated the work, begun by Garrison and the *Liberator*, of sending abolition documents into the South. The result was a storm of indignant protests from the slaveholders who resented what they termed an interference with their own domestic institutions. They declared that the abolition literature sent among them was incendiary and intended to excite servile insurrection, the most dreaded, because the most horrible, of events. Nat Turner's rebellion (q.v.) in Virginia (1831) was then still fresh in mind. In their excitement the slaveholders made certain demands upon the people of the North. They called for the suppression of the abolitionists and their work by public opinion and by State action. Rewards were even offered for the arrest and transportation to the South of Garrison and Arthur Tappan.

Public feeling in the North was already so bitter against the abolitionists that it hardly needed the added impulse of the South's demands. On 4 July 1834 the anti-slavery celebration in New York City was broken up and the leaders compelled to flee for their lives. For nearly a week the excitement continued. All the important daily papers, except one, encouraged the populace to suppress the abolitionists. Their business places and even their houses were attacked by the infuriated mob and the quarters occupied by the negroes were invaded and property destroyed. In nearly every Northern State the work of putting down the abolitionists went on. The rougher element was encouraged by resolutions passed by meetings of the respectable portion of the community. Fifteen hundred influential names signed a call for an anti-abolition meeting in Faneuil Hall. The great orators of Boston addressed an excited multitude. In a few days gallows were found standing in front of Garrison's home. A few weeks later at a woman's anti-slavery meeting a mob filled the streets, broke into the house to which Garrison had fled and dragged him out with a rope. He was rescued with great difficulty and was compelled to leave the city for safety. Danger threatened abolitionists in Brooklyn. Lydia Maria Child (q.v.) wrote: "I have not ventured into the city, nor does one of us dare to go to church to-day, so great is the excitement. Mr. Wright was yesterday barricading his doors and windows with strong bars and planks an inch thick." A mob led by representative citizens of Cincinnati destroyed the printing press of *The Philanthropist* and attacked the houses occupied by negroes. In 1837 an Alton, Ill., mob shot down the Rev. Elijah P. Lovejoy (q.v.), the editor of an abolition paper, while he was endeavoring to protect his press. This event and other extreme measures against the abolitionists overshot the mark, and public opinion became more sympathetic toward the hated and hunted disciples of the abolition creed. The great majority of them — women as well as men — showed the true martyr spirit, in the era of their persecution. But the rush of events was already drawing public attention away from the abolitionists and turning it toward other phases of the anti-slavery conflict.

The Quakers had begun in Washington's administration to petition Congress against the slave-trade. Later their petition struck at slavery in the District of Columbia. The abolitionists joined in the work of petitioning against slavery in the District. As early as 1831 John Quincy Adams, then a congressman, presented 15 such petitions, but declared that he did not approve of their object. From year to year these petitions had been received and referred to the committee on the District of Columbia and nothing more came of them. But in 1835 Hammond of South Carolina moved that an antislavery petition be not received. To some, this motion seemed necessary to check the rising tide of abolition petitions, but to others the remedy seemed worse than the disease, for it attacked the ancient right of petition. An exciting debate arose running throughout an entire day. Adams now came forward as the champion of the right of the petition and Slade of Vermont made a fiery speech declaring war upon the institution of slavery. This speech greatly angered the slaveholders and their supporters. In 1836 the debate over abolition petitions was renewed and continued for four months during which many thousands of persons put their names to petitions. The result was a resolution of the House to lay all papers relating to slavery on the table and to take no further action on them. This was the germ of the famous "gag" rule. But this action only stirred anti-slavery people and by 1838 petitions to Congress against slavery had increased tenfold. Early in 1840 the House made answer to these by establishing the following standing rule: "That no petition . . . or other paper, praying the abolition of slavery in the District of Columbia, or any State or Territory, or the slave-trade between the States or Territories of the United States in which it now exists, shall be received by this House or entertained in any way whatever." Similar, though more temperate, debates were going on in the Senate and similar results followed.

The attempts to suppress the abolitionists' agitation both in and out of Congress by attacking ancient popular rights very naturally produced a reaction in their favor and against the cause of slavery. The battle for the right of petition was waged, therefore, with untiring energy by John Quincy Adams, Joshua R. Giddings and others. The threats made to expel them from Congress and the denunciation heaped upon them only aided them in the end by bringing to their aid an increasing number of congressmen and in 1844 victory crowned their efforts; the gag rule was repealed.

Additional meaning was given to the questions of freedom of the press and the right of petition by the demands of the slaveholders that all anti-slavery documents be excluded from the United States mails. Some of the inhabitants of Charleston, S. C., broke into the post office (1835), seized a quantity of abolition literature and burned it in the presence of spectators. The Postmaster-General gave it as his opinion that although such documents could not lawfully be excluded from the mails, the postmasters owed a higher duty to their communities than to the laws. President Jackson, in a message to Congress, severely criticised the work of the abolitionists and recommended that Congress prohibit, under severe penalties, the circulation of such documents through the mails. Congress not only did not accept the President's recommendation, but instead passed a law providing for fining and imprisoning postmasters for withholding mail from the persons to whom it was addressed. On none of the points of contention had the opponents of the abolitionists been able to score a permanent victory. On the contrary the permanent results were against slavery. Among them may be enumerated the rapid increase of anti-slavery, if not abolition, sentiment and the formation of a political party. Another result was the feeling of many Northern men, who had little or no sympathy with the agitators, that the friends of slavery were demanding too great a sacrifice of cherished principles for its protection. One of the most deplorable results of 10 years of bitter agitation was the ill will engendered between the radical elements of the two sections. Neither could do right in the eyes of the other. The danger lay in the fact that other events might cause the spread of this sentiment to the steady minded classes of the two sections. Such events were already on the horizon.

The South came to feel that safety to slavery and to the social and industrial fabric based upon it lay in preserving the equilibrium between the sections in the Senate. That equilibrium had been hopelessly lost in the House of Representatives and to preserve it in the Senate required the addition of new territory to the United States. To accomplish this end, the annexation of Texas quickly followed the Texan revolution and the cession of California and New Mexico came as a consequence of war with Mexico. But it was far more difficult to determine slavery's relation to the new territory than it had been to win the territory by war. The South gave an indication of its coming attitude by defeating Van Buren for renomination in 1844, because he had opposed the immediate annexation of Texas. Northern anti-slavery men followed by defeating Henry Clay in New York by voting for a candidate of their own, because Clay, after opposing immediate annexation, had written a letter trying to explain the matter to the satisfaction of Southern Whigs. In 1846 President Polk asked Congress to vote a sum of money to assist him in making peace with Mexico. David Wilmot, a Pennsylvania Democrat, offered an amendment to the appropriation bill, providing that in any territory obtained from Mexico slavery should never exist. This amendment is the famous Wilmot Proviso (q.v.). Twice it passed the House, but each time failed to get through the Senate. Southern leaders were stirred to combat more vigorously the idea that Congress could exclude slavery from the Territories. Northern men affirmed more vehemently the right of Congress in this matter, because, to admit the South's contention would invalidate the anti-slavery features of the Ordinance of 1787 and the Compromise of 1820. The debates in Congress and the discussions by pulpit and press began to shake men's allegiance to the old parties. Therefore, the Whig party, the majority of whose votes was generally in the North, nominated for President (1848) Gen. Zachary Taylor, a Louisiana slaveholder, but refused to commit itself on the slavery question. The Democratic party, whose main

strength lay in the South, nominated Lewis Cass of Michigan and likewise uttered no decisive word on the vital question. This noncommittal attitude of the leaders of the old parties angered anti-slavery men of all parties who promptly coalesced and launched the Free Soil party at Buffalo, N. Y. (1848). The platform contained 19 resolutions mainly relating to slavery and declaring in favor of "Free Soil, Free Speech, Free Labor and Free Men." It also declared that Congress had, and ought to exercise, the power to exclude slavery from the Territories, but that it possessed no authority to interfere with slavery in the States where it already existed. Although this platform did not satisfy the extreme abolitionists, it offered a line of defense, on constitutional grounds, which appealed to moderate reformers who could not sympathize with the Anti-Union sentiment of Garrison and his radical followers. The slaveholders were right in believing that the underlying cause and the logical consequences of the Free Soilers and the abolitionists were not greatly different. The Free Soilers nominated Martin Van Buren for President and Charles Francis Adams for Vice-President. The Van Buren Democrats in New York, nicknamed the "Barnburners," supported the new party. The result was a nominal Free Soil vote of over 290,000, the loss of New York by Cass and the triumph of General Taylor. The Van Buren supporters were avenged by the defeat of Cass, and most of them returned to this allegiance.

During the next four years the Free Soil idea gained at the North, but the party made but little progress. The Compromise of 1850, and the consequent effort to discourage all agitation as dangerous to the perpetuity of the Union, discouraged any great gain by the party. Both the old parties in their nominating conventions (1854) pledged themselves to stand by the Compromise, and Hale, the Free Soil candidate only polled 156,000. The passage of the Kansas-Nebraska Bill (q.v.) (1854), suddenly precipitated the anti-slavery conflict in a more virulent form than ever before. The result was the break-up of the Whig party. Thousands of its Southern supporters joined the Democratic party (q.v.), while the majority of its Northern voters co-operated with other anti-slavery elements in forming a new party, the Republican. Although the organization of the Free Soil party was thus disbanded, its principle became the rallying cry of the Republican party (q.v.). See also SLAVERY.

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***27.* THE MEXICAN WAR.** Owing to its close association with the slavery controversy the Mexican War has been the subject of almost endless dispute. Many people believed at the time, and many others still believe, that it was forced on by a Democratic administration in order to secure more territory in the Southwest for the extension of slavery. It would be difficult either to prove or to disprove this view conclusively. The immediate cause of the war was the annexation of Texas. The Democratic platform of 1844 favored annexation, but at the same time it was equally explicit in asserting the American claim to Oregon, a territory which could not by any possibility be opened to slavery. To the party leaders this connection of the two questions may have been only a shrewd bit of politics, but President Polk's determination to fight for 54° 40′ showed that it meant much more than that to him. The success of the ticket also indicated that it meant more to the American people. The constant cry of a slaveholders' conspiracy would not blind them to the advantages of acquiring so much valuable territory. At the time of the annexation, Texas (q.v.) had been an independent republic for nine years, recognized as such by the leading nations of the world. Although the Mexican government had made no serious attempt during that interval to reassert its rights, it now notified the United States that annexation would be regarded as a *casus belli*. The passage of the joint resolution of 1 March 1845 was, in consequence, followed by the recall of the Mexican Minister at Washington and the formal suspension of diplomatic relations.

In addition to the Texas question there was a long-standing controversy in regard to the claims of American citizens against the Mexican government. During the numerous revolutions which had occurred since Mexico gained her independence Americans had often suffered imprisonment and loss of property. A claims convention of 1839 provided for a board of commissioners to pass upon these cases. There was some delay, however, in making the payments, and a second convention was concluded in 1843, in which Mexico agreed to pay all claims within five years in quarterly instalments. A few payments were made, but in 1845 they had again fallen very much in arrears.

In October 1845 President Polk informed the Mexican Secretary of State that he wished to settle the questions in dispute amicably, and that he was ready to send an envoy with full power to act. The secretary made an evasive reply in regard to the subjects to be discussed, but expressed a willingness to receive our representative. The President at once commissioned John Slidell, of Louisiana, as envoy, and he set out for his new post in November. The war fever was so strong in Mexico when Slidell arrived that President Herrera was forced to refuse him an audience. A revolution, which occurred a few days later, resulted in bringing General Paredes, the head of the war party, into power. Being again refused recognition, Slidell returned to the United States in March 1846.

If annexation and the spoliation claims had been the only questions involved, the war might still have been averted. But a controversy arose in regard to the western boundary of Texas. The Congress of Texas in 1836 asserted that the boundaries of the republic extended to the Rio Grande. Historically the claim to the territory

between the Nueces and the Rio Grande was of doubtful legality, but owing to internal difficulties the Mexican government had taken no steps to assert its authority. Texas was admitted into the Union with "the territory properly included within and rightfully belonging" to it, but subject to the adjustment by the United States government of all questions of boundary that might arise with other governments. If the Mexican authorities had received Slidell this question might properly have come up for discussion. Their refusal left but one course open to the President, namely, to treat the Nueces-Rio Grande tract as American territory. The revenue laws were extended to it, and Corpus Christi, a town west of the Nueces, was made a port of entry. The Mexican authorities resented this intrusion, and a large force of men under General Ampudia were stationed on the south bank of the Rio Grande, preparatory to an invasion of the disputed territory. To oppose him, Gen. Zachary Taylor with about 2,000 men was ordered to advance to the north bank of the river, opposite Matamoros. On 12 April Ampudia warned Taylor to withdraw beyond the Nueces within 24 hours or take the consequences. The warning being disregarded, General Arista, Ampudia's successor, sent notice on the 24th that hostilities were commenced. On the same day a considerable force of Mexicans crossed the river a few miles above Matamoros and defeated a detachment of United States dragoons.

The news of this engagement reached Washington early in May, and on the 11th President Polk sent a special war message to Congress. After speaking of the failure of the Slidell mission and explaining the movements of General Taylor, he went on to say that war already existed, that it existed by the act of Mexico itself and, consequently, that it was the duty of the American people to vindicate the honor, the rights and the interests of their country. (See MEXICAN WAR). The whole question hinged upon the ownership of the Nueces-Rio Grande strip. According to the President this district belonged to the United States, and the war was, therefore, defensive in its origin. On the other hand, if the Mexican claims to the strip were valid, Polk exceeded his constitutional powers in beginning an offensive war without the consent of Congress. However, the President's position was safe enough because Congress had already recognized the country beyond the Nueces as American territory, by including it within the revenue system, and the Senate had ratified the appointment of a revenue officer. Two days after the message was received an act was passed providing for the vigorous prosecution of the war.

Whether or not the war was defensive in origin, it was certainly not long conducted on that basis. After his successes at Palo Alto, 8 May, and at Resaca de la Palma, 9 May, Taylor crossed the Rio Grande and captured Matamoras on the 18th, before he could possibly have heard of the Congressional act of the 13th. The President's military orders showed clearly his intention to seize Mexican territory. General Kearney was authorized to occupy New Mexico, Commodore Sloat to take possession of Upper California and Taylor to prosecute the war in Mexico. These orders were faithfully executed. Kearney captured Santa Fé and brought all of New Mexico under subjection. Frémont and Commodore Stockton, who had succeeded Sloat, were equally successful in California. Taylor made his way slowly into the interior. In September, after defeating an army under Ampudia, he captured Monterey.

The anti-slavery Whigs in Congress pointed to these facts as evidence that the war was not being waged to protect the honor of the United States, but purely in order to seize the territory of a weaker power. Among the discontented was Abraham Lincoln, who was elected to Congress in 1846. Jefferson Davis approved of the war and resigned his seat in Congress to lead a Mississippi regiment. In general the conflict was popular in the South and unpopular in the North, the strongest opposition being in New England. Lowell's keen satires in the 'Bigelow Papers' represent well the sentiment of that section of the country. See LOWELL, JAMES RUSSELL.

In spite of adverse criticism, President Polk never once swerved from his original line of action. Early in 1847 a second army was sent out under Gen. Winfield Scott to land at Vera Cruz, and to attack the capital from the east. The series of Mexican disasters at the beginning of the war had resulted in another revolution which restored Santa Anna to power. His plan was to meet Taylor first, defeat him and then return to the city of Mexico in time to defend it against Scott. The battle of Buena Vista was fought 23 February 1847. Taylor's force of 5,000 men won a victory over an army four times as large. Immediately after the battle Santa Anna hurried south to meet General Scott. The two armies first came into conflict at the mountain pass of Cerro Gordo, and the Americans were again successful. This was followed by the victories of Contreras, San Antonio and Cherubusco. The way was now open to the City of Mexico, but the arrival of a peace commissioner from the United States led to the conclusion of an armistice. See MEXICAN WAR.

The scene now shifts to Washington. President Polk had been confident of success from the very beginning of the war. As early as 8 August 1846 he asked Congress for $2,000,000 to be used in negotiating a peace. This was far more than enough to meet the ordinary expenses of peace commissioners. The object of the President, however, was perfectly clear; in fact he made no attempt to conceal it. Mexico was to be called upon to cede New Mexico and California. A bill was introduced into the House of Representatives to appropriate the amount required. David Wilmot, a Pennsylvania Democrat, moved the insertion of a proviso to the effect that neither slavery nor involuntary servitude should exist in any territory to be acquired by the war. (See WILMOT PROVISO). It was passed by the House in 1846 and again in 1847, but was defeated by the Senate on both occasions. The House finally yielded, and the appropriation, increased to $3,000,000, was made without the proviso.

Nicholas P. Trist, of Virginia, was at once sent to Mexico as a peace commissioner. He was authorized to demand the cession of New Mexico and Upper California and the recognition of the Rio Grande boundary. This was

the minimum to be accepted. In order to obtain these terms he was to begin with an additional demand for Lower California and for the right of way across the Isthmus of Tehuantepec. At the proper moment he might surrender these points and also offer a money consideration. The Mexican authorities refused the terms, negotiations were broken off and General Scott renewed his campaign. On 13 September he stormed the heights of Chapultepec, and on the following day entered the City of Mexico. The enemy were now compelled to accept whatever terms were offered to them. Negotiations were reopened with Trist, and the Treaty of Guadalupe Hidalgo was signed 2 Feb. 1848. It was sent to the Senate 23 February, ratified by them with amendments 10 March, and the final ratifications were exchanged 30 May. In return for $15,000,000 and the assumption by the United States of the spoliation claims of their citizens, estimated at $3,250,000 more, Mexico ceded California and New Mexico, and recognized the Rio Grande frontier. Mexicans living in the ceded territory were to be free to continue to reside there or to remove to Mexico, without any prejudice to their property. Those who remained could either retain the title and rights of Mexican citizens or become citizens of the United States.

The immediate result of the war, then, was the acquisition of the vast territory comprising the present States of California, Nevada, Utah, Arizona north of the Gila and parts of Wyoming, Colorado and New Mexico. More than half a million square miles of valuable land were transferred from a non-progressive nation to a nation that was able to develop its resources. The enormous mineral deposits of that region were just beginning to be developed. And even now, over half a century after the peace, the agricultural industry, owing to the tardy extension of irrigation facilities, is still far from its maximum development. Many of the best people in the country in 1848 were so blinded by the slavery issue that they could not realize the value of their conquest. Fortunately for our history, such men as Cass and Douglas had sufficient influence partially to allay the prejudices of their section and thus to secure the ratification of the treaty.

But, although the anti-slavery sentiment was not strong enough to embarrass the government in the conduct of the war or to endanger the treaty of peace, still it could not entirely be kept in the background. That was shown, for example, in the struggle over the Wilmot Proviso. As soon as peace was concluded and it was no longer necessary to keep up the appearance of unanimity before the enemy, the controversy was renewed. Three questions came up for solution: Should California be admitted as a free State? Should the remainder of the territory acquired from Mexico be organized in accordance with the Wilmot Proviso? What should be the boundary between Texas and New Mexico? These questions and others connected with slavery were nominally settled by the compromise of 1850, but the controversy was soon renewed in a more violent form, and culminated in secession, civil war and emancipation. See MEXICAN WAR, THE; TEXAS.

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28. SLAVERY. When the English colonies were first established in America, chattel slavery of white people had nearly died out in Christian Europe, although serfdom to the owner of the estate to which one was attached still prevailed in Russia, Germany and many other parts of Europe. In England the only recognized chattels were the rare negroes or Asiatics owned as a matter of pride by a few wealthy men. In the New World, however, the English colonists adopted the Spanish habit of enslaving such of the native Indians as they could possess themselves of; but the tribesmen were sullen, insubordinate and short lived. The slavery of that race was never of any economic importance, though as late as 1692 an Indian woman, Tituba, was one of the Salem witches.

Part of the white population in all the English colonies was in a condition not far different from serfdom, until some time after the American Revolution. This was the distinct class of so-called "indented" or "indentured" white servants, both men and women, who served their masters for a term of years, sometimes for life, and were almost completely subject to his will. One element of this class was convicts. The early planters begged for "offenders condemned to die out of common gaols." By 1650 grew up a regular practice of "transporting" some criminals instead of hanging them, and it is estimated that first and last 50,000 convicts came over. For instance, a Scotchman was sold as a slave for life to America for the heinous offense of burning the Bible; and in 1736 Mr. Henry Justice of the Middle Temple stole books and in consequence was transported to America, "there to remain seven years, and to be put to death if he returned, etc.," and one Sarah Wilson, servant to a maid-of-honor to the queen, was landed in Maryland, put up for sale and purchased. Another fruitful source of indented servants was the political prisoners. After the battle of Worcester, in 1650, about 1,000 Scotch-

men were ordered sent to the colonies. In 1716 a lot of Jacobites were sent over.

By far the larger and more important class of white serfs was that of the "redemptioners," who agreed with some shipmaster to carry them over and in America to sell their services for a term of years to any purchaser for a sum sufficient to pay their passage money. Thus, in 1774, John Harrower, whose diary has been preserved, "was obliged to engage to go to Virginia for four years as a schoolmaster for bed, board, washing and five pounds during the whole time." He was duly sold to a Virginia gentleman, and lived a respectable and honest life. Many such servants on expiration of their time set up for themselves and founded families. White servants frequently ran away from their masters and were advertised, pursued, arrested, whipped and branded exactly like slaves.

By far the most important phase of American servitude was the slavery of the African negroes; it was directly related to the centuries of war between the Mohammedans and the Christians in Europe, which engendered a deep-seated belief that Christianity forbade the slavery of Christians, but allowed the enslavement of infidels. In 1517 Las Casas, a benevolent Spanish divine, suggested that negroes be imported into the West Indies from Africa, to save the remnants of the unhappy Indians. The African slave trade at once sprang up in the Spanish and Portuguese possessions; and by 1670 the English adventurers, especially Sir John Hawkins, began to engage in this profitable business. The first English continental colony to buy negro slaves was Virginia, where, in 1619, a Dutch ship of war sold some in exchange for provisions; but it was in the English West Indies, especially the sugar-growing islands of Barbadoes, Tobago and Jamaica, that slavery first found a profitable field. To these islands were sent most of the white convict slaves, and the continent received for its supply of negro slaves only those already seasoned in the West Indies.

Though so early established, negro slavery was of very little importance on the continent during the 17th century. The total number of negroes in all the colonies in 1700 was probably not more than a tenth of the whole population. The 18th century saw, however, a lively slave trade, and widely distributed slaves. England forced from Spain the privileges of the Assiento — that is, the monopoly of carrying slaves from Africa to the Spanish colonies. For supplying these laborers to the North American colonies, a direct traffic grew up from Africa in colonial vessels, chiefly owned in New England and in New York. Newport and Bristol, R. I., were noted centres of the trade.

The result was that negroes were distributed more or less throughout all the colonies, although their condition, employment and treatment was very different from community to community. Excepting on Narragansett Bay and the Hudson River, where there were plantations with large numbers of slaves, the negro in the Northern colonies was chiefly a house servant, and the institution was here at the best; the old North Church in Boston still contains a gallery for such people. Negroes probably were no worse treated than indentured servants or apprentices of the time, and were often much valued and respected by their masters.

Proceeding southward, in Pennsylvania the number of negroes was large, and in Maryland, Virginia, the Carolinas and Georgia slavery was an established part of the social and economic system. The cruelties of the institution were most manifest in the scattered plantations of the Carolinas, in which the slaves considerably outnumbered the white people. There about 1780 Saint-John Crèvecœur found a negro servant exposed in a cage, left there to be devoured alive by insects and by birds, which had already destroyed his eyes; his unpardonable offense was killing a white man.

The steady growth of slavery is remarkable because it was actually prohibited by two of the New England colonies. Massachusetts in the Body of Liberties in 1641, drawn up by Rev. John Cotton, declared that, "There shall never be any bond slaverie, villianage or captivitie amongst us unles it be lawfull captives taken in just warres, and such strangers as willingly sell themselves or are sold to us." And Rhode Island in 1652 "ordered that no black mankind, or white . . . serve any man or his assigns longer than ten years." These acts were a dead letter; slaves were born, grew up, died and left the taint to their posterity in every Northern community, as well as in the South.

Indeed, there was in every community a body of positive legislation relating to terms of transfer of slave property, and to special offenses of slaves, and of white people toward slaves, so that the institution of slave property was as firmly rooted and as widely disseminated as that of private property in land. This is the more striking, because in England the enslaving of blackamoors was thought inconsistent with human rights. In the celebrated case of James Somersett, in 1772, Lord Mansfield held that slavery was "so odious that nothing could be suffered to support it but positive law"; there being no such law in England, he therefore refused to compel James Somersett, whom his master had brought from Virginia to England, to remain in the custody of that master.

Long before slavery acquired such a firm and important status, it was attacked by philanthropic men. In 1624 John Usselinx objected to slavery in the proposed Swedish colonies. Georgia was founded in 1732, as an anti-slavery colony, but the restriction was given up in 1749. The first Englishman to protest against colonial slavery was Roger Williams in 1637, and John Eliot in 1675 declared that "to sell soules for mony seemeth to me a dangerous merchandize." Richard Baxter, favorite English Puritan author of devotional books said in 1673, "To go as Pirates and catch up poor Negros or people of another Land, that never forfeited Life or Liberty, and to make them slaves, and sell them, is one of the worst kinds of Thievery in the World." Samuel Sewall, in his tract 'The Selling of Joseph,' says: "Originally and Naturally, there is no such thing as Slavery, because all Men, as they are the sons of Adam, are Coheirs; and have equal Right unto Liberty, and all other outward Comforts of Life."

The most efficient agency against colonial slavery was the disapproval of the Quakers, both North and South. The German Quakers of Germantown in 1688 adopted a minute against the traffic in negro slaves, to the effect that though they were black, there was still no more liberty to have them as slaves than there was to have white ones. The organization of the Quakers in local meetings gave them an opportunity to develop an opposition to human slavery which was inherent in their attempt to embody the Golden Rule in their own lives; hence there sprang up Quaker agitators, of whom Anthony Benezet and John Woolman were the most famous. John Woolman has left a delightful journal, edited by Whittier, full of the quaint records of his laborious journeys to testify against the evils of human slavery. Furthermore, many Quaker meetings passed minutes disapproving of slavery, and eventually disfellowshipping members who insisted on holding them. They did much to raise the standard of treatment of slaves and caused the liberation of large numbers.

For one of the many anomalies of the system of human bondage was the existence of a considerable class of free negroes everyone of whom was a tacit protest. If slavery was justified by the inferiority of the race, then all negroes ought to be slaves. To put any of them on an equality with the white man was a confession that the system had no rational basis except greed.

By the time of the Revolution both slavery and anti-slavery were firmly established in the English colonies. The slave trade continued steadily; and outside the Quakers and a few other reformers, there was little protest against it on moral grounds. Yet efforts were made to restrict it in some of the colonies; in the Northern, because they wished to raise a revenue from it; in South Carolina because they feared slave insurrections. Whatever the reason, all such colonial acts were regularly vetoed by the governor, or disallowed by the home government, on the ground that a trade so profitable to British merchants must not be diminished.

The main objection to slavery before the American Revolution was that it was contrary to Christianity; indeed for many years the planters objected to the efforts to evangelize their slaves, on the ground that a baptized slave might claim freedom as a Christian. Yet planters had their slaves, kept them, worked them, if they felt like it killed them with overwork, and ignored the philanthropists. The larger number of the negroes continued to be pagans in a Christian land.

The Revolution added a second argument of immense weight, namely, the rights of man. It is perfectly true that the framers of the Declaration of Independence, when they said that "all men are created equal," had in mind men who were sharers in the government; but some negroes had the requisite property qualifications and were voters in all the colonies but two and thereafter in States both North and South. Still when the Revolutionary patriots so vehemently declared that they never would be slaves they could hardly have forgotton that about one-sixth of the community were actual slaves. The progress of the Revolution emphasized this contradiction, for large numbers of negroes were enlisted in the Continental Army, especially in the Northern States, where they sometimes served in regiments indiscriminately with white men. Rhode Island was obliged to promise freedom to slaves who joined the army and to liberate their families; and a dangerous rift was thus made in the system of slavery.

This rift was widened by the action of several States during and immediately after the Revolution. In 1775 an abolition society was formed in Pennsylvania under the presidency of Benjamin Franklin and similar societies followed in the New England States. These organizations at once began to petition legislatures to secure better treatment for slaves, and even to prohibit slavery altogether. The movement rapidly gained headway in the Northern communities where slaves were few and vested property interests were small.

In 1777 the people of Vermont drew up a State constitution containing clauses "that all men are born free and independent," and that hence slaves should be set free at the age of majority. The next community to act was Pennsylvania, where under strong pressure from the abolitionists, 1 March 1780, an act was passed declaring that all persons thenceforward born within the State should be set free at 28, thus putting slavery in process of extinction. Still more effective was the action of Massachusetts which, in 1780, adopted a new constitution, drafted by John Adams, the opponent of slavery. The bill of rights included the declaration "that all men are born free and equal, and have certain natural, essential, and inalienable rights, among which may be reckoned the right of enjoying and defending their lives." In 1783, in a test case, the Supreme Judicial Court held that under this clause there was no such thing as slavery in Massachusetts. The precedent thus set was followed by New Hampshire in 1783, in a constitution similar to that of Massachusetts; and by gradual emancipation acts in Rhode Island and Connecticut in 1784. For a time the tide was stayed; then in 1799 New York, and in 1804 New Jersey, passed gradual emancipation acts. Thus, of the 16 States admitted to the Union before 1800, eight became free.

Meantime the national government had also taken important and far-reaching steps in regard to slavery. The First Continental Congress, to damage English trade, drew up the Association of 1774, in which the colonists agreed not to import slaves; and this prohibition was maintained throughout the Revolution. Most of the States passed laws prohibiting the slave trade, so that when the Revolution was over there appear to have been no importations for a time.

The opposition of the Northern States to slavery was quickly reflected in Congress, where from 1775 to 1777 there were hot disputes on the question of assessing Federal taxes; the Northern States insisting that slaves ought to be counted either as a part of the population, or a part of the wealth of the South; the South insisting that slaves were not as productive as free men and that they ought not to reckoned at their full number. Upon the more serious question of territorial slavery the Confederation Congress took radical ground, for it

became necessary to provide a government for the immense areas added to the United States both north and south of the Ohio River. In 1784 Jefferson reported an ordinance which included a clause that in all the new Territories, «after the year 1800 of the Christian æra there shall be neither slavery nor involuntary servitude.» For lack of one vote in one State this clause was rejected; but in 1787, in the Northwest Ordinance, Congress applied to the Northwest Territory the prohibition which had failed three years before. Hence, when the Constitutional Convention of 1787 adjourned, slavery was prohibited in the whole section of the country north of Maryland (except New York and New Jersey), by action of the States; and from the Pennsylvania line westward to the Mississippi, by Congress.

When the Federal Convention assembled at Philadelphia in May 1787 it speedily became evident that slavery, or rather the division of the Union into a free and a slaveholding section, was an obstacle to the work. Following the suggestion of Mr. Madison, that it was «wrong to admit in the Constitution the idea of property in men,» the Convention scrupulously avoided using the words slave and slavery in the final document, but six clauses in the final draft distinctly refer to that institution.

1. The apportionment of direct taxes «shall be determined by adding to the whole number of free persons . . . three-fifths of all other persons.» This clause was the result of a long and bitter controversy. As Gerry of Massachusetts put it, «why should blacks who are property in the South, be in the rule of representation more than cattle and horses in the North?»; while Pinckney of South Carolina thought that in apportionment «the blacks ought to stand on an equality with the whites.»

2. «The migration or importation of such persons as any States now existing shall think proper to admit, shall not be prohibited by the Congress,» prior to 1808. This clause of course related to the slave trade, complete control over which was for a time withheld from Congress; and the concession to the Northern States was part of a bargain by which they retained the right to pass navigation acts.

3. A clause relating to fugitives provided for the return of any person «held to service or labor in one State, under the laws thereof, escaping into another.»

4. «The citizens of each State shall be entitled to the privileges and immunities of the citizens in the several States,»—a clause afterward applied to, or claimed for, negroes.

5. «Congress shall have power to dispose of and make all needful rules and regulations respecting territory or other property belonging to the United States.» This was the power under which the Northwest Ordinance of 1787 had prohibited slavery.

6. Congress shall have power to exercise exclusive legislation in all cases whatsoever, over such district (not exceeding 10 miles square) as may, by cession of particular States and the acceptance of Congress, become the seat of the government of the United States, and to exercise like authority over all places purchased by the consent of the legislature of the State in which the same shall be, for the erection of forts, magazines, arsenals, dockyards and other needful buildings.

The experiment was now fairly under way of carrying on a Federal government with three different principles as regarded human slavery, —freedom in the Northern States; slavery in the Southern; and a discretionary power over territorial slavery in the Federal government. The difficulties of this situation were clearly shown when, in 1790, the abolition societies petitioned Congress to regulate the slave trade; and the House of Representatives passed resolutions in which they expressly disavowed any power to regulate slavery within the States. Three years later Congress exercised its power over fugitive slaves by passing an act which provided that under the authority of the United States and on the certificate of any magistrate, a master or his agent might personally apprehend a slave escaped into a free State.

In 1789 Congress exercised its power to deal with slavery in the Territories by re-enacting the ordinance of 1787; but in 1798, on the organization of Mississippi Territory, the anti-slavery clause was omitted, and slavery was allowed to continue there. In 1801 the United States took over the District of Columbia and reaffirmed the pre-existing laws of Maryland, including harsh slave codes. The act for organization of the Territory of Illinois contained a clause which in 1820 was applied by the Missouri Compromise to the northern portion of the Louisiana Purchase. Meanwhile a long continued agitation in England against the slave trade resulted in an act against it in 1806. This example was helpful in the United States which, by Act of 7 March 1807, laid an absolute prohibition on the foreign slave trade which was enforced by additional acts of 1818 and 1820.

In 1821, on the final admission of Missouri, Congress insisted that a clause in the State Constitution prohibiting the incoming of free negroes should be withdrawn, because contrary to the citizenship clause.

In the 40 years from 1790 to 1830 the conditions of slavery radically changed. In 1790 the census showed 700,000 slaves; in 1830 there were 2,000,000, in each case about one-third of the total population of the slave-holding communities. The persistence of slavery was unexpected for in 1790 it was dying out from want of profitable employment. When Eli Whitney invented the cotton gin for separating the seed from the fibre (1794) a profitable crop was opened up to slave labor. The product of cotton in 1800 was 210,526 bales, in 1830 1,038,847 bales. It is a crop requiring cultivation during a considerable part of the year and adapted to rude labor in large gangs; it thus made slave labor profitable in the Gulf States, and furnished a market for the surplus slave population of the border slave States; hence all sections of the South had an economic interest in its continuance.

Looking at slavery from the side of the slave, the conditions varied extremely; in general the work was lighter and the relations with the master more humane in the border slave States where farming was more diversified. The great cotton, rice and sugar plantations of the Far South made heavier demands upon the slave; and the plantations were often managed

by hired overseers. The conditions varied also according to the character, intelligence and temper of the masters; easy-going, kind-hearted, genuinely religious masters and mistresses often felt a strong personal responsibility for their slaves; but it was part of the system of slavery that passionate, coarse and overbearing men and women might own slaves and frequently treated them with harshness, severity or extreme cruelty.

The condition of the slave varied also according to his employment. Most of them were field hands, engaged in the rudest and most toilsome labor; but some were employed as roustabouts on the river steamers, as longshoremen, and others as skilled carpenters, blacksmiths, masons, plasterers and the like. A much greater number were busy as household servants, there being practically no other domestic service obtainable in the South. People, therefore, who needed such services and owned no slave hired one — almost always the handsomest, most intelligent and most promising slaves were used for household service, and it was a highly prized privilege, bringing better food, abundance of cast-off clothing and personal relations with the white people.

The field slaves worked long hours, commonly from sunrise to sunset, and were kept up to their work by white overseers, and on large plantations also by negro slave drivers armed with the whip. Men and women and half-grown boys and girls were engaged in this field labor. Their houses were cabins in the negro quarters, usually small, dark and dirty, but often as good as the ordinary house of the poor white. The clothing of the field hand was rough, coarse and scanty. Thrifty planters estimated that it cost about $15 a year, on an average, to feed and clothe a slave.

Most adult slaves were married, but family relations were so disturbed by sale and a feeling of irresponsibility that such relations were very changeable. The slaves usually had Sunday free and a few days of jollification at Christmas; in many churches negroes attended the same services and were received as members. Many communities had their own churches with a rude and boisterous worship, conducted by slave preachers.

One of the incidents or accompaniments of slavery much in the minds of people at that time was sale. Negroes who, in the colonial days, could be bought as low as $50, by 1830 were worth $500; and by 1860 prime cotton hands were quoted as high as $1,500. The South, in 1860, valued its slave property at about $2,000,000,000. Of course this high value depended upon the opportunity to market surplus slaves and to buy hands as needed; hence, a lively system of picking up slaves at private sale, gathering them into coffles or gangs and shipping them south by land or river, there to be sold out again. Though the slave trader was universally despised by the white people, the kindest master might get into debt and have to sell his slaves, or his death might cause his property to be divided. Auction sales were very frequent and abounded in pathetic incidents of the division of families and the sale of infants away from their mothers.

Another frequent incident was escape. Slaves were always running away and taking refuge in swamps or forests; many of them returned, took their flogging and went to work again; many others became fugitives, and made their way to the Northern States; and thousands of them remained there or passed on farther north to Canada. These fugitives were commonly the most determined and ablest of their race and by stealing themselves they depreciated slave property, especially in the border States.

A third striking incident of slavery was manumission,— from early Colonial days slaves were set free by indulgent masters during their life or by their wills; and the free negroes in the South in 1860 were about one-sixteenth of the whole number. The process of setting slaves free was commonly hedged about by two restrictions: (1) The master must give bonds that the freedman should not become a public charge; (2) in some States he was obliged to remove him from the Commonwealth in which he was set free.

A fourth incident was insurrection. Beside several risings in Colonial days, of which the New York Slave Plot of 1741 is the best known, there were three insurrections or attempted insurrections in the 19th century: the Gabriel insurrection in Virginia (1800); the Denmark-Vesey in Charleston (1822); and the Nat Turner rising in Virginia in 1831, in which 70 white people were massacred. This was the last of such movements; even during the Civil War there was no slave rising in the South, but the fear of it was a constant motive in the minds of the Southern people.

Looking at the institution of slavery from the point of view of the master, the Southern community was divided into three strata of white people: (1) The large slaveholders. In 1850 about 2,000 families owned as many as 100 slaves each; the largest number under one management was about 2,500. These 2,000 families made up the social and political aristocracy of the South, furnished a great number of the professional men and almost all the holders of high political offices, State or national, in the South. (2) The small slaveholders, about 350,000 families: of these, in 1850, about 60,000 held only one slave. Such people commonly had a poor living, in rough houses with unsavory food and few opportunities for their children; with them were associated a considerable body of non-slaveholding farmers. (3) At the bottom of society was the great class of poor whites, including the mountaineers; they held no slaves, but owned their own land and lived upon it in a miserable fashion. They were a naturally intelligent people, but extremely ignorant and made up about three-fourths of the white population. They implicitly followed the political leadership of the great planters and were perfectly persuaded that the cause of slavery was their own, although they were looked down upon by well-to-do white men, and were sometimes despised by slaves.

The system of slavery was maintained by a rigorous code of special laws. Property and mortgage right in slaves were protected by law. The masters were assured the physical control of slaves by laws and customs which gave them authority to compel obedience and

force labor; and to resist any real or supposed belligerency of the negro by force, which commonly took the form of whipping. The laws held a master responsible for killing a negro, unless in defense of his life; but negro testimony could not be received against a white man, and the law of a State which absolved the master in case a slave was so inconsiderate as to die under a "moderate" chastisement sufficiently indicates that public sentiment demanded giving discretion to the master in all doubtful cases.

Assemblages of slaves and any sort of riotous behavior were dealt with by special acts. In many States special tribunals of the slaveholders in the neighborhood took testimony in a summary fashion, and executed punishment, even to the taking of life. There were also special laws against the consorting of whites with negroes, or their purchase of property from slaves. Runaways were stopped by a system of patrols, a kind of voluntary mounted police, who scoured the roads and picked up suspected characters.

Such was the system of slavery, a system of brute force, buttressed by a powerfully welded public opinion, backed up by a body of positive law. On many plantations the life of a slave was easy enough, labor was light and he was looked on as a reasoning being; on other plantations he was treated worse than the beast of the field, because he could talk and was held to the responsibility of men. Slave labor was notoriously inefficient and wasteful; and small planters made very little out of their slaves. The larger planters, by working out a kind of machine system, had better results; but it was at the expense and the degradation of their white neighbors as well as of the slaves.

The Southern opposition to slavery, which had been widespread in 1787, grew less and less as the years went on, though till 1830 there was a national anti-slavery organization, which held a convention about once in two years, usually in a border State city. The system of slavery grew more and more deeply rooted, and when the Northern abolitionists began an active crusade against it in 1831, the Southern societies disappeared and only a handful of Southern men and women could be found who would so much as make a public argument against the desirability of slavery.

From looking on slavery as an "evil" which must be destroyed, by 1820 the South as a community were thinking of it as a difficulty which could not be removed without destroying the country. By 1830 they grew to advocate it as something which, whether evil or not, must neither be attacked nor discussed; thence it was an easy step to advocate it as desirable in itself, as Calhoun put it, "a good, a positive good." In the last stage of the contest, just before the Civil War, Southern leaders like Jefferson Davis insisted that slavery must be extended in some degree to the Northern States.

The abolition movement is elsewhere discussed,—our object at this point is to show how slavery, so strongly buttressed in the interests and the pride of the South, yet quickly came to an end. As has already been shown, when the two sections had clearly adopted opposing systems of labor, many questions of choice between the two systems came before the Federal government. It was in vain to urge that slavery was a State institution existing only under State laws, in the face of the fact that Congress, by its regulation of the slave trade in the District of Columbia, of international relations, of fugitives and of the Territories, had a power to increase or to diminish the slave power. In fact, the national government furnished the arena in which the question was finally fought out.

The first great step came about 1835, when the abolitionists, in part encouraged by the English acts abolishing slavery in the West Indies (1830–35), began to send petitions to Congress asking for the prohibition of slavery in the District of Columbia. The South was able to influence enough Northern votes to secure a succession of gag resolutions, intended to prevent discussion in Congress; but the question sprang up in many unexpected ways. The apparently innocent power of carrying mails by the Federal government brought to light objections to the delivery of abolition mail at the Southern post offices. The Southern leaders attempted to stop the rising tide of discussion of slavery in Congress; but John Quincy Adams arose as the champion of free speech, and he was speedily aided by other men like Joshua R. Giddings of Ohio, who would not be silenced.

By 1842 it was plain that nobody could prevent the discussion of slavery throughout the North and in Washington; soon it had to be discussed, because of new questions of Territorial slavery. The principle of dividing the Union by a geographical line continued by the Missouri Compromise of 1820 was tested again when in 1845 Texas was brought into the Union with the express purpose of furnishing material for a body of slave-holding States; Congress deliberately prohibited slavery in the territory claimed by Texas, north of 36° 30′.

Then followed, in 1848, the annexation of New Mexico and California, with the plain expectation that the 36° 30′ line would be produced to the Pacific. The North, however, was aroused and the people of California refused either to divide their Commonwealth or to admit slavery within its borders. By the compromise of 1850, California was acknowledged free, and New Mexico and Utah were practically left as fighting ground for slave power; yet Congress, in 1848, passed a fourth significant act prohibiting Territorial slavery, this time in Oregon. In the same compromise of 1850, Congress passed a new Fugitive Slave Law and prohibited slavery in the District of Columbia.

The contest was raised again by the Kansas-Nebraska Act of 1854, framed by Douglas, which repealed the Missouri Compromise and, by implication, the three other acts prohibiting slavery in the Territories; and left Kansas to be controlled by the first set of people who might get on the ground. Contrary to expectation, the first set were from the North, and the determination of the Southern settlers in Missouri and of the South generally to take possession of Kansas in spite of the will of the majority of the settlers occasioned a civil war in Kansas, six years before the greater national Civil War.

By this time it became evident that slavery was a political question which divided the nation; and in 1856 the first large and widespread anti-slavery party was formed. The

Dred Scott Decision of 1857 was an attempt to suppress the controversy, and to take it out of politics, by denying the right of Congress to prohibit slavery in a Territory, though that right had four times been exercised, with little opposition. From this time the drift was steadily and irresistibly toward Civil War,—and the crisis was reached in 1860, when the Southern Democracy demanded, as a condition of remaining in the Union, their right to share in all territory thereafter annexed, and to have an end of abolition agitation in the North.

Although in a resolution of 22 July 1861 the House of Representatives declared that slavery was not the cause of the war nor the freeing of the slaves its purpose, from the beginning it was plain that slavery was the great question which divided the two sections, and that consequently its future was inextricably woven into that struggle. Hence, the war had hardly begun before there came a series of special enactments and executive proclamations. (1) On 26 April 1862 an act of Congress freed the slaves in the District of Columbia, with a compensation of about $300 a head. (2) On 19 June 1862 an act, in flat defiance of the Dred Scott Decision, prohibited slavery in every Territory. (3) On 2 July 1862 an act was passed providing that slaves of persons engaged in rebellion against the United States thereby gained their freedom. President Lincoln was all the while turning over in his mind a larger scheme, and on 22 Sept. 1862 he issued a preliminary proclamation, followed on 1 Jan. 1863 by a final proclamation, of emancipation, by which all slaves within the seceding States were declared free, excepting in the State of Tennessee, and certain districts of Virginia and Louisiana which were within the Federal lines.

To the national prohibitions of slavery in the Territories, the District of Columbia and the seceded slave States were added the actions of three slave-holding communities: West Virginia, by its Constitution (21 March 1862), Missouri by a vote in convention (1 July 1863), and Maryland by a new constitution (13 Oct. 1864), declared for absolute or gradual emancipation. They thus joined the cohort of freedom, so that at the end of the war the only regions within the boundaries of the United States in which slavery remained legal were Delaware, Kentucky and Tennessee, the last of which States declared for freedom by a new constitution in 1865.

Slavery was thus practically at an end. Nevertheless under the then accepted theory of the Constitution, both Congress and the States might legally re-establish it. To prevent that contingency and to wipe out the last vestige of the system, the 13th Amendment was introduced into Congress, received the necessary two-thirds vote (22 Feb. 1865) and 18 Dec. 1865 it was announced that the necessary three-fourths of the States had ratified it, and that to the text of the Constitution had been added the significant words, "Neither slavery nor involuntary servitude, except as a punishment for crime whereof the party shall have been duly convicted, shall exist within the United States, or any place subject to their jurisdiction."

As Lincoln said a few days before his death, "We have finished the job." Beginning in 1775 with a United States in which slavery was the normal condition of every community and every square mile of vacant territory, the struggle of 90 years ended with a condition in which by the firmest of constitutional enactments the normal status was everywhere that of freedom. The amendment even reached out into the future, and covers all annexations made or that can ever be made; so that chattel slavery of human beings, no matter what their color, is now absolutely unknown to the law of the United States or of any State, Territory or dependency.

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29. FINANCES (1816–1861). In 1816, at the close of war with England, the chief problem of the government was the restoration of currency to a specie basis. Dallas, upon assuming the office of Secretary of the Treasury in 1814, vigorously endeavored to secure a charter for a second United States bank through which pressure might be exercised upon the local banks to resume specie payments. The Republican party as a whole had long opposed a bank founded upon a Federal charter; and notwithstanding Dallas' support promptly advanced constitutional objections. The discussion ran through two years in which several plans were proposed; the principal points of difference were, first, whether the capital of the bank should be based upon treasury notes or upon government stock; second, whether the bank should be forced to loan money to the government; and third, whether the bank should be given power to suspend specie payments. The bank was chartered in March 1816. Its capital was based in large part upon government stock; the government in addition subscribed to the stock and had representation in its management. The bank was obliged to transfer the public funds free of charge, and was made the depository of government moneys. As a return for the exclusive privilege of a national charter, the bank paid to the government a bonus of $1,500,000. The establishment of this institution was quickly followed by a Congressional resolve that after 20 Feb. 1817 all dues to the government should be paid only in specie, treasury notes, notes of the Bank of the United States or in notes of local banks which were

payable on demand in the foregoing currency. This decisive action forced the State institutions to adopt sounder methods, and on the date named there was general resumption.

In 1816 the revenue system was reorganized, not for lack of revenue, but because the enormous volume of imports rushing into the country upon the return of peace endangered domestic manufactures which had been abnormally stimulated during the war. The value of imports in 1816 was estimated at $116,000,000 as compared with $13,000,000 in 1814. Customs duties amounted to $36,000,000, far surpassing the previous estimate of Dallas of $13,000,000. Even President Madison affirmed the necessity of protection. A new tariff bill was consequently enacted 27 April 1816; in particular the cotton industry received protection. In December 1817 the internal revenue duties were repealed; and in the following year supplementary customs duties were placed upon iron commodities, thus establishing the policy of protection. In these measures the South cordially joined, and Calhoun, who afterward bitterly opposed the high tariff policy, at this time supported higher duties.

During 1816 and 1817 the treasury was in a most favorable condition; revenue exceeded all expectation, yielding surpluses amounting in two years to nearly $30,000,000. Good fortune, however, did not continue; the new United States Bank was mismanaged and the currency was once more thrown into disorder. This, together with an extraordinary commercial and manufacturing expansion, led to a crisis in 1819. The revenues were severely affected and customs duties which yielded $26,000,000 in 1817 fell back to $13,000,000 in 1821. In 1820 and 1821 the treasury budget showed a deficit. Expenditures for the navy and pensions were reduced; and a change in the management of the bank, with a contraction in its circulation and loans, led to a revival of business and improving revenues. Beginning with 1822 the treasury annually enjoyed a surplus (except in 1824 when a large payment was made on account of Spanish claims) which was applied to the reduction of the debt. In 1820 an attempt was made to increase tariff duties, partly to help the revenues at that time embarrassed, and partly in behalf of protection. The bill passed the House but failed in the Senate by one vote. Clay and John Quincy Adams championed protection and liberal expenditures for internal improvements, cardinal points in the «American System.» The effort was renewed in 1824 and protection was sought in particular for iron, wool, hemp, glass and lead, industries of the Middle West. The contest now assumed a sectional division, the Middle Western and Southwestern States being arrayed against New England and the South. New England's chief interest at this time was in commerce, and her leading representative, Webster, made an exhaustive argument in behalf of freedom of trade. The measure became law by a vote of 107 to 92; in the South there was but one vote in favor to 47 against. During the next 10 years the tariff question occupied a large place in Congressional debate and legislation. The tariff of 1824 fell short of the demand of woolen manufacturers, and agitation for a revision with still higher rates resulted in the tariff of 1828. New England was turning more and more to protection, and Webster under instructions made a speech declaring that through the encouragement of the Act of 1824 capital had been invested which needed further protection. The woolen tariff, or Tariff of Abominations, as the measure was frequently termed, aroused the fiercest controversy, which finally led to nullification and the compromise tariff of 1833. By this latter act a horizontal reduction of duties, spreading over a number of years, was made and for a while the tariff question yielded in importance to other political issues.

A persistent attack upon the United States Bank, resulting in its downfall as a Federal institution, began in 1829. President Jackson in his first annual message in 1829 raised the question of constitutionality, and doubted the value of the bank in establishing a sound currency. In its place he suggested an institution more directly under the management of the Treasury Department with power to receive both public and private deposits, but with no right to make loans. Jackson undoubtedly voiced the conviction of Western democracy, that the affairs of the government should be divorced from private corporate undertakings. The suggestion had little immediate influence, for both branches of Congress made reports in favor of the bank. In 1831 Senator Benton took up the fight against the bank, resting his argument upon the evils of all kinds of bank notes, and in particular attacked the issue of branch drafts. In 1832 the bank petitioned for a new charter and was successful in carrying its bill through Congress. Jackson interposed a veto, laying stress upon the evil of a money monopoly. He did not stop here but next determined on the removal of the government funds from the custody of the bank; in this he was encouraged by his re-election in 1832 which he interpreted as a popular endorsement of his opposition to the bank. There were doubts, however, as to the legality of removal of the public moneys without the sanction of Congress. W. J. Duane, who was appointed Secretary of the Treasury in June 1833, refused to take the responsibility, and although Taney, the Attorney-General, supported Jackson's contention, Duane remained obstinate. He was forced from office and was succeeded by Taney, who on 26 September issued an order directing the deposit of public moneys henceforth in certain local banks. These institutions, popularly known as Jackson's «pets,» were chosen with care, and by the Act of 23 June 1836, the regulation of public funds was strictly prescribed so as to safeguard the interests of the government in every possible way.

In 1835 the public debt was paid off; customs receipts had steadily increased; and beginning with 1830 there was an enormous expansion in revenue from sales of public land. In 1834 and 1835 the annual receipts from this source alone were nearly $15,000,000 and in 1836, $25,000,000. A new fiscal problem of dealing with a surplus was thus created; many schemes were projected, chief among which was Clay's proposition that revenue from lands be distributed among the several States. Any plan to prevent a surplus by lowering customs was negatived on the ground that the tariff question has been, for the time being at least, settled by the Act of 1833 and ought not to be reopened. On the other hand, there was objection to the

distribution of the proceeds of land sales on the ground that public lands had been ceded for paying off the Revolutionary debt; that this national income could not in fairness be given to States which had not originally shared in the gift, and that the Constitution required all revenues to be appropriated for specific objects. Others desired to make large expenditures for internal improvements, fortifications or education. It was impossible to pass a distribution bill, but the same end was reached by the Act of 23 June 1836, providing for the deposit of certain surplus funds in the treasury, amounting to $37,000,000, with the several States in proportion to their respective representation in Congress. In law this was a deposit which could be recalled, but it was practically regarded as a gift to the States. The deposits were to be made in four quarterly instalments during the year 1837. Before the deposit was completed the country was involved in a commercial panic which made it impossible for the government to pay the fourth instalment.

On 1 July 1836 the Treasury Department issued an order known as the Specie Circular, requiring all land agents to accept only specie in payment for public lands; as local bank notes had been previously received, and specie was scarce in the West where sales were made, speculative operations based upon land were sharply checked. Eastern banking institutions with Western connections were obliged to contract their loans, and this, coupled with a heavy transfer of funds, in accordance with the Deposit Act, proved a severer strain than many banks could stand. The evils were aggravated by commercial failures in Europe, decreasing crops and Southern speculation in cotton. In May 1837 the banks throughout the country suspended specie payments, and as the treasury had parted with its funds it shared in the distress and was also forced to suspend. During the next few years treasury notes were issued amounting to $47,000,000, of which one-third were reissues; and between 1841 and 1843 there were three long-term loans. With the exception of 1839, there was a series of annual deficits until 1844.

The failure of the banks to protect the funds of the government led President Van Buren to recommend the establishment of an independent treasury system by which the government might take care of its own funds. A prolonged dispute within the party over the details of this plan, as well as the opposition of Whigs who wished to establish another United States Bank, deferred the passage of the independent Treasury Act until 1840. In 1841 the Whigs gained the election and used their power by repealing the Treasury Law. Owing to the vacillating opposition of Tyler, who succeeded President Harrison, it proved impossible to pass constructive legislation, and for lack of other agencies the public funds were once more placed with local banks; this practice continued until 1846. Whig success also led to a revision of the tariff in the Act of 1842 along protectionist lines. Additional reason for higher duties was found in the embarrassment of the treasury and the need of increased revenue. In 1846 the Democrats regained the Presidency and at once re-established the independent treasury system and enacted a new tariff. The Treasury Act of 1846 provided for the custody of public funds at mints, custom-houses and at subtreasuries in a few of the larger cities. It also provided that all public dues should be made either in specie or treasury notes, thus excluding bank notes. The system in its main features has remained unchanged to the present time, and it has been successful in safeguarding the funds of the government.

The tariff of 1846 was a free trade tariff; specific duties were abolished; and the duties were so rated as to yield the largest amount of revenue. Commercial enterprise was again at a high level; railroad construction and foreign immigration contributed to new industrial development; and in spite of the temporary interruption occasioned by the war with Mexico, the treasury entered upon another long period of prosperity. Customs receipts were large; the sales from public lands again proved fruitful; and repeated surpluses made it possible to reduce the debt, until in 1857 it stood at $28,800,000. In 1857 another reduction in tariff rates was made to which all sections of the country gave generous support. Railroad construction, however, had been carried too far and capital for the moment was unprofitably tied up in unproductive investment. Bank note circulation was unduly expanded, and a panic occurred in August 1857. The treasury with weakened resources fell into embarrassment and was obliged to issue treasury notes to meet its obligations. In the years 1858–60 the deficits amounted to $50,000,000.

During the period 1816–61, the United States became a commercial nation, necessitating new methods of customs administration. The regulations affecting the appraisement of goods were made more strict. Credits to importers were abolished, and in its place a system of warehousing was established. Among the later Secretaries of the Treasury, Walker and Guthrie stand out pre-eminent, the first for his notable report in which he recommended the tariff of 1846 and the second for his development of administrative details. See also UNITED STATES — FINANCES (1861–1919).

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30. EFFORTS TO SETTLE THE SLAVERY QUESTION. In all co-operative efforts of the North and South to settle disputes over slavery the preservation of both slavery and the Union were objects of primary consideration. The roots of such efforts are found in the compromises of the Constitutional Convention of 1787. The most important agreements then made provided that (1) three-fifths of the slaves should be counted in determining the number of congressmen a State should have and the amount of direct taxes it should pay and that (2) the African slave trade should continue for 20 years. These compromises are significant partly because the "more perfect union" could probably not have been formed without them and partly because the "Fathers" thus gave the stamp of approval to compromis-

ing disputes over slavery, for the sake of the Union. By the aid of the three-fifths advantage the South, in 1790, had but three less congressmen than the North. But each succeeding census showed a constantly growing majority in the North's favor so that by 1820 this majority amounted to 43. But the South had already begun to look for the protection of her interests in the preservation of an equilibrium in the United States Senate, where population is not so directly represented.

Of the original 13 States seven were Northern and six Southern. During the administrations of Washington and Adams, Vermont, Kentucky and Tennessee were admitted and established an equilibrium between the two sections in the Senate. The admission of Ohio (1802) and Louisiana (1812) preserved this situation. The addition of Indiana (1816), Mississippi (1817), Illinois (1818), and Alabama (1819) still kept up the balance. But the application of Missouri for permission to form a State constitution in 1819 threatened to break the plan of alternate admissions. Besides, slavery seemed to be making a flank movement into territory which might be looked upon as geographically belonging to the North, since nearly the entire eastern line of Missouri faced the free State of Illinois. The South's need of Missouri was indeed great, for but two more possible slave States remained to be carved out of Territories. Congressman Talmadge of New York introduced an amendment to the bill permitting Missouri to form a constitution, which precipitated the first great quarrel over slavery between the two sections, and which threatened the existence of the Union. This amendment, called the "Missouri Limitation," provided that no more slaves should be taken into Missouri and that slave children born within the State should be free at 25 years of age. The House of Represenatives passed the amended bill, after warm debates, but the Senate struck out the amendment and then passed the bill. The House refused to accept the change and the measure was lost for the time being. In the next session the contest was renewed, but was given a new turn by the Senate linking the bill for the admission of Maine, which the House had already passed, to the bill authorizing the people of Missouri to form a State constitution. The Senate passed this bill with the proviso that slavery should be prohibited in the territory north of 36° 30′, but twice the House rejected the bill in this form. A committee of both houses, however, agreed upon the following compromise: (1) The separation and passage of the Maine and Missouri bills; (2) the prohibition of slavery in the remainder of the territory of the Louisiana Purchase north of 36° 30′. Both houses accepted the compromise and President Monroe signed the bill (1820).

But the quarrel which the people hoped had been settled was suddenly renewed in a more violent way than before. The constitution presented by Missouri to Congress looked toward the exclusion of both mulattoes and free negroes from the State. The fiery debates, the resolutions from State legislatures on both sides of the question which had already been presented to Congress, and the widespread discussion in the newspapers, led patriotic men to fear a dissolution of the Union. Therefore, Henry Clay at once took the lead in trying to settle the new dispute. Although the House rejected the report of the committee of 13, Clay did not give up, but by his persuasive eloquence, and by personal appeals to members, he finally induced the House to pass a bill to admit Missouri as a State on the condition that her legislature give a pledge that the State would never pass a law excluding the citizens of any other State. Missouri gave the pledge and was admitted (1821). Three important consequences followed from the Missouri contest: (1) The conviction that danger to the Union could force a compromise; (2) that Congress accepted the South's contention against placing unusual restrictions upon a State as it enters the Union; (3) that Congress had the power to prohibit slavery in the Territories. The remote effect of thus devoting the northern part of the Louisiana Purchase to free labor was far-reaching.

The second conflict over slavery which seriously menaced the Union had reference to territory obtained by the Mexican War (q.v.), Anti-slavery men sought to exclude slavery from such territory by the Wilmot Proviso (q.v.), while pro-slavery men attempted to secure their interests by an extension of the Missouri Compromise line to the Pacific. Both of these efforts failed, but the discussions in and out of Congress deepened sectional feeling. Excitement was further increased by events in California. The discovery of gold on the Sacramento (1848) drew a large, hardy, but reckless population from all quarters. The disorder which resulted made organized government an immediate necessity, but a bill to establish Territorial government for that region failed. California did not wait long on Congress, but called a Constitutional Convention whose delegates voted unanimously for a constitution prohibiting slavery. The people of California ratified the constitution by an overwhelming majority. Thus circumstances beyond the control of either party to the contest placed California beyond the reach of slavery. In the meantime the State of Texas seemed to be preparing to enforce her claims to a large portion of what is now New Mexico. Anti-slavery men opposed the demand of Texas because it was expected that New Mexico would follow the example of California. President Taylor recommended Congress to admit California immediately as a State and expressed the opinion that the people of New Mexico would soon follow the example of California (1849). The radical pro-slavery men were grievously disappointed over this attitude of President Taylor and strongly favored first putting California and New Mexico through the experience of Territorial government. Such a plan would have given slaveholders time to move into those Territories. Slavery had not yet learned that in the race for population it could not compete with freedom. The irritation of the two sections was now so great that men again feared for the safety of the Union. Although Henry Clay had retired from public life to spend his few declining years, the legislature of Kentucky without a dissenting vote re-elected him to his old place in the Senate, hoping that the spell of his presence and the power of his eloquence might once more restore harmony between the sections. In January 1850 Clay produced his most famous com-

promise bill. The following were its main features: (1) That California be admitted as a free State; (2) that the Territories of New Mexico and Utah be organized and that the question of slavery be left for their people to settle; (3) that Texas be paid $10,000,000 to satisfy her claims against New Mexico; (4) that the slave trade be abolished in the District of Columbia; (5) that a more efficient Fugitive Slave Law be passed. The debates over these measures continued into September and brought out the most splendid array of oratorical talent ever seen in the Senate. Stimulated by his last great effort for the Union, Clay seemed to gather new vigor, was unremitting in his labors and frequently spoke with his old-time power. When he rose to make his great speech a vast concourse which filled even the avenues to the Senate greeted him with tremendous enthusiasm, and hung in breathless silence upon his words. When he had finished, women crowded to imprint on his wan cheek the kiss of admiration and approval. His effort kindled afresh the fire of patriotism.

The hand of death was also upon the mighty Calhoun. He was only able to sit in his place and listen to another read his last speech. The burden of his address may be summed up in three propositions: (1) The restoration of the equilibrium between the North and the South by an equal division of the territory and by an amendment to the Constitution in order to guarantee the equilibrium; (2) a new law for the return of fugitive slaves, and the cessation of anti-slavery agitation; (3) the peaceful secession of the slave States from the Union, if the above propositions are rejected. Calhoun was asking for an impossible Union and an impossible secession. The other member of the great trio, Daniel Webster, had been silent thus far, and no man, probably, knew what he would say, least of all his New England supporters. On 7 March Webster addressed the Senate in a speech "For the Constitution and the Union." He made an appeal for conciliation and condemned agitation whether by Northern or Southern men. But he seemed to lay the greater blame for the distracted state of public opinion upon anti-slavery men. For this unexpected position they roundly denounced Webster and his popularity in the North began to wane. Clay and Webster were of the past and had spoken for the past. But the men of the future were in the Senate also: Seward, Chase, Douglas and Davis. There was less of compromise in these men. Seward, in particular, aroused criticism by declaring in favor of a "higher law" than the Constitution, in dealing with the slavery question. Davis demanded the extension of the compromise line of 1820 to the Pacific. In spite of the efforts of Clay and his supporters, Congress refused to accept the bill as a whole. But after Taylor's death, President Fillmore gave his influence in favor of the various parts of the bill, for, although no majority could be found for the measures as one bill, Congress gave majorities to the separate parts.

The people of the country seemed ready to accept the main features of the agreement and special efforts were made to impress upon the people the necessity and fairness of the result. Union meetings were held at which Whigs and Democrats vied with each other in praising the compromise as a final and fair adjustment of the slavery question. Although these efforts seemed somewhat artificial, the result was a lull in agitation. The two old parties, in 1852, in national conventions pledged themselves to stand by the Compromise. Pierce was overwhelmingly elected President and was known to be a warm supporter of the Compromise. With these happy omens, politicians began to speak of a "second era of good feeling." One feature of the Compromise, however, threatened to disturb the promised peace. The provisions of the law for the rendition of the fugitive slaves were exasperatingly severe. The fugitive was denied the right to testify in his own behalf and was refused the use of the writ of habeas corpus. Any citizen could be summoned to aid in capturing and returning the fugitive and could be fined and imprisoned for aiding him to escape. Slaveholders, who had lost many slaves through the operation of the Underground Railroad (q.v.), put the new law into vigorous operation. One result was a number of "rescue mobs." The most famous were the rescue of the slave Shadrach in Boston by a crowd of his own color, and the rescue of the slave Jerry in Syracuse, by citizens led by Gerrit Smith and Samuel J. May. If the execution of the Fugitive Slave Law failed to renew the controversy with its old time bitterness the introduction of the Kansas-Nebraska Bill (q.v.) (1854) by Stephen A. Douglas, senator from Illinois, more than accomplished this result. This measure was intended to settle the slavery question by turning it over to the people of the Territories of Kansas and Nebraska to determine for themselves whether they would have slavery or not. This bill involved the repeal of the Missouri Compromise and was amended so as to specify that fact. The reason given was that the Compromise of 1820 was not in harmony with that part of the Compromise of 1850 which left the question of slavery to the people of New Mexico and Utah. A flame of resentment spread over the North. Since the South had not demanded the measure, it appeared that Douglas was gratuitously presenting to slavery what had heretofore been regarded as free soil, and that, too, by the repeal of a compromise venerated on account of its age. In spite of intense opposition in Congress and the fierce denunciations heaped upon the measure by pulpit and press, it became a law and compromise was at an end. Douglas lost in popularity at the North. He was burned in effigy in many places, and was even howled down in his own city of Chicago while trying to justify his conduct. The race for Kansas began before the bill became a law, and soon free State settlers and slave State settlers were struggling for its control. (See KANSAS). Two Territorial governments, two delegates to Congress, two constitutions and armed collisions followed in rapid succession. It was necessary to call in Federal troops to preserve order in Kansas. The doctrine of popular sovereignty had failed in application. The Whig party was dead and in its stead a powerful anti-slavery party, the Republican, had arisen. Even the Democrats who remained loyal to the party were divided on the question whether a fair test of popular sovereignty had been made or not. Douglas and his followers in the North declared that the pro-slavery con-

stitution of Kansas had not been fairly ratified by the people of Kansas. President Buchanan and his supporters asserted that the test was fair and that Kansas should be admitted as a slave State.

While the contest over Kansas was raging and threatening to involve the country in war, an entirely new method of solving the problem was tried. It was planned to take slavery completely out of politics by means of a Supreme Court decision. The case of Dred Scott (q.v.) offered the opportunity. Dred Scott had sued for his freedom on the ground that having resided in a free State he could not be held in slavery on return to a slave State. The decision contained two points of historical importance. The first denied that the negro was entitled to the natural rights enumerated in the Declaration of Independence and the second asserted that neither Congress nor the Territorial legislature could prohibit slavery in the Territories. The South rejoiced over the decision, but public sentiment at the North refused to accept its conclusion because it not only refused to the negro his natural rights as a man, but in effect asserted that Douglas' doctrine of Popular Sovereignty and the Republican free soil principles were opposed to the Constitution. Instead of taking slavery out of politics, this decision drove the question in so deep that the country was hastened rapidly toward the crisis.

The Lincoln-Douglas joint debates (1858) so widened the breach between Northern and Southern Democrats that the national convention of the party in Charleston in 1860 witnessed its complete disruption. The Southern delegates utterly repudiated Douglas and popular sovereignty, the only man and the only principle on which the Northern wing of the party could conduct a campaign with any show of success. Four parties were in the field and the Republicans with Lincoln won. During the fall and winter following, seven Southern States seceded from the Union. They had done what had been threatened for several years. The North had not believed the threats and was alarmed at the result. The Union of the Fathers was in danger of annihilation. «What could be done to save it?» was a question asked by thousands of persons. Nothing decisive could be done. An old administration and a timid President were passing out. The new President and an untried administration had not yet assumed responsibility. In such a period how naturally men turned to compromises in order to ensure the return of the seceded States and to prevent others from withdrawing.

President Buchanan in his message to Congress declared that concessions to the South were the only means of saving the Union. Both houses entered on the work of conciliation by carefully appointing committees. The Senate's committee of 13 was made up of six Republicans and six Democrats. A seventh member was the venerable John J. Crittenden of Kentucky, a non-partisan. The House committee of 33 was made up in the same careful way. The Senate committee soon fell into hopeless disagreement and accomplished nothing. The House committee worked under great disadvantages. Two Southern members refused to serve, and after the events at Fort Sumter others left the committee. More than 40 propositions and plans were submitted. Some were wise and some were foolish. Some proposed that no changes be made in either the laws or in the Constitution respecting slavery. Others proposed changes which involved the reconstruction of the very foundations of the government. The report of the committee, however, recommended a number of far-reaching concessions: (1) The repeal of all Personal Liberty bills by which States had hindered the execution of the Fugitive Slave Law; (2) An amendment to the Constitution prohibiting future amendments, interfering with slavery, which were not proposed by slave States; (3) Immediate admission of New Mexico as a slave State; (4) The trial of fugitive slaves in the States from which they escaped. No less than seven minority reports from members of the committee were presented to the House. The report was finally adopted, after fruitless discussion, but too late to check the tide of secession. It probably convinced the border slave States that they were safe within the Union. The impression made by the Southern members on the border State men was not so favorable, particularly because they refused to accept the simple statement «that peaceful acquiescence in the election of a President, constitutionally accomplished, was the paramount duty of every good citizen.» The House modified and passed the amendment so that no future amendment might be made granting Congress power to interfere with the domestic institutions of any State. The Senate accepted the amendment by the requisite two-thirds vote. Eight Republican senators voted in its favor. But two States ratified it, Ohio and Maryland, one free State and one slave State. The most famous advocate of compromise was the venerable Senator John J. Crittenden, of Kentucky, the successor of Henry Clay. Although the Committee of Thirteen accomplished but little, Crittenden presented to the Senate a series of six amendments to the Constitution: (1) That in all the Territories north of 36° 30′ slavery should be prohibited, in those south of that line slavery should be protected; (2) That Congress shall have no power to abolish slavery in places where Congress has jurisdiction; (3) That Congress shall have no power to abolish slavery in the District of Columbia or prevent Federal officers from taking their slaves into the District; (4) That the United States shall indemnify slaveholders for loss of slaves through failure of officers caused by violence or intimidation; (5) That no future amendment shall destroy the preceding amendments or give Congress power to interfere with slavery in any State whose laws permit slavery. Petitions from all parts of the North prayed for the acceptation of the Crittenden Compromise. Although petitions came in from the South, and although the compromise was almost entirely in the interest of slavery, it was defeated by six Southern senators refusing to vote. Three days after this defeat, the legislature of Virginia invited the other States to send commissioners to Washington to «adjust the present unhappy controversies . . . so as to afford to the people of the slaveholding States adequate guarantees for the security of their rights.» All the States sent commissioners except five free and eight slave States. Ex-President John Tyler was elected chairman. From 4 to 27 February the «Peace

Convention,» as it was called, discussed propositions for conciliation. It finally recommended to Congress the amendment of the Constitution very much after the plan of Senator Crittenden. But the Confederacy was already organized. Federal forts had been seized, and Lincoln's administration was about to enter upon its duties. The situation had moved beyond the point of compromise. Men were no longer willing to follow in the footsteps of the «Fathers,» and Congress gave little or no heed to the work of the Peace Congress. See UNITED STATES — SLAVERY.

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31. CAUSES OF THE CIVIL WAR. The Civil War was the culmination of the development of conflicting interests and feelings between the slave and the free States. Slavery in Colonial days, aided by favoring physical conditions, obtained a deeper hold in the South than it did in the North. The invention of the cotton gin increased that hold in many ways, and hastened the growth of industrial and social differences between the two sets of States. The North, with its free labor, was able to respond to the industrial revolution which found its origin in certain great mechanical inventions, including the application of steam as a motive power, the manufacture of iron and the use of coal as fuel. Northern industry became rapidly diversified and Northern population grew with great rapidity and built up great centres of production. The South, with its Slave labor, did not, or could not, take advantage of the new industrial forces, but pursued the older and quieter ways of plantation life. Her occupations did not increase greatly in number or change in character and her population remained, as formerly, largely agricultural. The meaning of two such contrasting industrial and social conditions was not clearly seen at first. It took the tariff policy from 1816 to 1828 to show that these contrasting interests were becoming conflicting interests. The adoption of a distinctly protective policy caused commercial New England to enter upon an era of manufacturing, although her capital had been largely in the carrying trade. This same policy, after 8 or 10 years, convinced Southern leaders that their hopes of the South's profiting by the tariff were doomed to disappointment. Hence, in defense of their section and the interests built upon its system of slave labor, these leaders generally united in opposition to the tariff. But how could the South successfully oppose protection while in a minority in the House of Representatives and while not able to carry Kentucky, Louisiana and possibly other slave States against the tariff?

Southern leaders soon began to pronounce the tariff unconstitutional, but as neither Congress nor the Supreme Court had so held, this sort of opposition was not very successful. But John C. Calhoun of South Carolina went further and declared that according to the Kentucky and Virginia Resolutions, the final appeal of the slave States should be to the right of nullification by which, according to his view, any sovereign State might refuse to obey any law of Congress which the State deemed unconstitutional. The principles of the Kentucky and the Virginia Resolutions (q.v.) had been again and again asserted by the New England States during the War of 1812. James Madison, the author of the Virginia Resolutions, denied Calhoun's interpretation of them, and the other slave States refused to follow South Carolina into nullification in 1833. They did, however, accept more and more the States Rights view of the Constitution, as a means of shielding their peculiar interests. Every additional conflict between the two sections only intensified the South's view of this political doctrine, and in the end stood to the seceding States as the constitutional justification of secession. With little exception, during this same period, the North was moving just as certainly further and further from the views of the Hartford Convention and more and more toward the nationalistic view of the Constitution. The doctrines asserted by Webster and Hayne in the great debate were typical of the position of the two sections. The two sections, therefore, were not only developing interests more or less antagonistic, but were developing views of the Constitution best suited to the defense of their respective interests.

During Andrew Jackson's administration the consciousness of hostile sectional interests was deepened by other events besides the tariff controversy. Again and again in the *South Carolina Exposition,* and in other papers intended to prepare the way for nullification, Calhoun set forth the idea of permanent industrial and social differences between the two sections. The attack by the abolitionists upon slavery as morally wrong, and the reply of the slaveholders in demanding the suppression of anti-slavery agitation, by denying the right of petition on the question of slavery, greatly strengthened the idea that the two sections possessed contrasting and conflicting interests. The natural consequence was the rise of antagonistic feeling between the slave and free States. The growth of hostile feeling went rapidly forward during the contests over the annexation of Texas and over the Mexican War. Southern leaders declared that the acquisition of new territory for slavery was necessary to preserve the balance of power in the Senate and give fresh soil and a wider area for slavery. The anti-slavery men declared that, for these very reasons, no such territory should be acquired. Both parties began to threaten the Union. In 1844 the legislature of Massachusetts passed a resolution, introduced by Charles Francis Adams, which referred to the Constitution as a «compact» and asserted that annexation was an undelegated power to which Massachusetts would not submit. Southern declarations of dissolving the Union, if slavery should be excluded from the Territories, were even more emphatic.

The year 1844 witnessed another event which revealed the widening difference between the two sections. After an exciting contest over slavery the Methodist Episcopal Church split into a Northern and Southern branch. This division made it easier for both parties to obtain both religious sanction and religious condemnation for their work. This situation added

greatly to the bitterness of the strife. The feeling between the pro-slavery and the anti-slavery elements became so pronounced in the next few years that both Whigs and Democrats in the Presidential campaign of 1848 refused to make any definite statement on the slavery question. The anti-slavery Whigs resented this non-committal position of their party and many of them joined in the formation of the Free Soil party, which pledged itself to oppose the extension of slavery to the Territories. At the same time the new party declared that Congress was powerless over slavery in the States where it existed. The election of 1848 revealed a further tendency toward sectionalization among the voters of the two old parties. Because General Taylor, the Whig candidate, was a Southern slaveholder he received a much larger vote in the South, where the great strength of the Democrats usually lay; while Cass, the Northern Democrat, received somewhat similar support in the North, though not so striking on account of the Van Buren defection. For the next two years the gulf of sectionalization greatly widened.

The specific cause of contention was the question of slavery or no slavery in the territory obtained by the war with Mexico. The South felt that slavery must go into the new lands, not only because that section needed the new region to add to her weight in the councils of the nation, but, also, because the region was acquired largely through her own efforts. The North was becoming more and more outspoken in opposition to the extension of slavery into the new region obtained from Mexico. Nearly every Northern legislature resolved in favor of the power and duty of Congress to prohibit slavery in the Territories. The legislature of Virginia resolved that if this principle be carried out the people of Virginia must either submit to "aggression and outrage" or resist "at all hazards and to the last extremity." Public meetings in several Southern cities approved the strong words of Virginia. Although the number in favor of dissolving the Union rapidly increased in the South and grew bolder in asserting their views, the great mass of people were yet true to the Union.

When, therefore, Henry Clay, by the unanimous vote of the legislature of Kentucky, was called from retirement and sent back to the Senate to restore harmony and to strengthen the weakening bonds of union his efforts met with sympathy and support on the part of the masses of the two sections. By the compromise of 1850, the admission of California as a free State and the abolition of the slave trade in the District of Columbia were balanced by the payment of $10,000,000 to Texas and by a new Fugitive Slave Law. "Union" meetings were held in various places to bring public opinion into hearty accord with the compromise. Nevertheless there were men in both sections who had little or no faith in the measure as a means of allaying the hostile sectional feeling. The greatest argument of the South in support of the compromise was the greatest argument of the North against the compromise — the Fugitive Slave Law (q.v.).

The drastic provisions of this law and the new zeal for its enforcement caused a wider development of the "Underground Railroad" (q.v.). But to hinder further the return of the fugitive to his master, some of the Northern States began to pass Personal Liberty Laws. The Kansas-Nebraska Bill (q.v.) and the consequent contest for Kansas, led the majority of Northern States to nullify, as far as possible, the execution of the Fugitive Slave Law by means of some such legislation as the Personal Liberty Laws. This legislation was cited by more than one seceding State, in 1860 and 1861, in justification of secession. Immediately, however, the South became more and more irritated because, on account of the opposition of Northern men, so few fugitives were returned, while the North became more and more irritated because, by the aid of Northern men, so many fugitives were returned. It is instructive to note that the people of the extreme Southern States, who lost few or no slaves, and the people of the extreme Northern States, who knew least about slavery, were the loudest in talk and most radical in action.

The growth of political association and interest which bound parties together had done much to strengthen the Union. But the excitement aroused by the passage of the Kansas-Nebraska Bill and the bitter conflict for the possession of Kansas destroyed the Whig party, and dealt the Democratic party a severe blow. Southern Whigs went over to the Democrats, while Northern Whigs joined with anti-slavery Democrats and Free Soil men in forming a new anti-slavery party, the Republican, a purely sectional party. The break-up of the Whig party left an inheritance of suspicion and ill-will that boded nothing but evil.

The election of 1856 resulted in a victory for the Democrats, but the Republicans carried all the Northern States but four. The falling off in the Northern Democratic vote was as ominous as the disappearance of the Whig party. Would, therefore, the oldest party in our history also break in two along sectional lines, and former political friends be turned into enemies? Such an event, many believed, would indeed hasten the disintegration of the Union.

It was probably clear to the great leaders of the Democratic party that if the struggle in Kansas should go on much longer, nothing could prevent the Northern and Southern wings from taking opposite sides. Hence, the decision in the Dred Scott Case (q.v.) was hailed as the means of settling the dispute over Kansas by taking the question out of politics entirely. Chief Justice Taney, in rendering this decision, declared that, according to the Constitution, neither Congress nor the legislature of a Territory could exclude slavery from the Territory. The decision, in effect, placed the doctrine of Popular Sovereignty and the Republican party under the ban of being opposed to the Constitution. The question was not taken out of politics, for while the South applauded, the North denounced, the decision. Even Northern Democrats wavered in its support; for of what use was Popular Sovereignty, the doctrine of their favorite, Senator Douglas? The clearer this question became, the more uncertain became the question: Can the Democratic party be held together in support of the slaveholders' view? The Lincoln-Douglas joint debates, in 1858, settled that question in the

negative. Lincoln forced Douglas to admit that he believed that a Territory could exclude slavery from its limits in spite of the Dred Scott decision. Douglas took this stand in order to keep faith with the Democrats of Illinois and of the North. But Southern leaders watched the debate with deep interest, and were mortally offended at this position of Douglas. They immediately began to take steps to "read him out of the party." But Douglas went into the National Democratic Convention at Charleston in 1860 with a majority of delegates in his favor. They stood faithfully by him and voted down the platform of the Southern wing of the party. Southern delegations, one after another, withdrew from the convention, and the party of Jefferson and Jackson was broken in two. Later, in convention at Baltimore, no compromise could be reached and both factions nominated Presidential candidates. With the Republican party, there were thus three sectional parties in the field. How completely the people were imbued with sectional feelings may be seen from the fact that the one party — the Constitutional Union — which professed to be a national party and urged the putting away of sectional questions received only 80,000 votes in the North. Douglas obtained about 1,300,000 votes, but only 163,000 from the slave States. Lincoln received but 26,000 of his 1,800,000 votes from the South. The strong ties of political association were breaking under the strain of sectional hostility, and it seemed that the only thing wanting was some overt and formal act to certify to the division in sentiment which already existed. When, however, South Carolina took the leap, after Lincoln's election, and six other States followed her example, and when it became apparent that secession meant a conflict of arms, then those deeper and more fundamental interests than party politics began to assert themselves. The conservative forces born of the history of the past and of the hopes of the future began to call out for concession and compromise. During the winter of 1860–61 Congress, under pressure of the conservative interests and patriotic feelings, made vigorous efforts to allay the demon of sectionalism. The Peace Convention (q.v.) which met in Washington in February 1861, also endeavored to aid in restoring harmony. But the movement of events was too rapid. Lincoln was in the Presidency but a few weeks before Sumter fell, and the two sections were at war. It is of little consequence which of the parties struck the first blow, for there seemed nowhere any power or influence strong enough to long prevent sectional animosity from bursting into flame.

The causes of the war or rather of secession, as viewed by the South Carolina Secession Convention, are here briefly epitomized: (1) The American Revolution established the right of a State to govern itself and the right of a people to abolish a government, and that each colony became a free, sovereign and independent State. (2) That the Constitution is a compact and was agreed to by soverign States. Since the obligation established by a compact is mutual, its violation by a single party to the contract releases the others. (3) We assert that 14 States have refused for years to fulfil their constitutional obligations by hindering the return of fugitive slaves. (4) "These States have assumed the right of deciding upon the propriety of our domestic institutions" and have denounced as sinful the institution of slavery. (5) They have permitted societies to disturb the peace and incite servile insurrection. (6) They have elected a man President who is hostile to slavery and who has declared that the government cannot endure permanently half slave and half free. This analysis of the causes as stated by the first State to secede shows that the irritating and real cause was the question of slavery and that the doctrine of State sovereignty was used as a justification of the act of secession.

Finally it may be said that another cause which hastened the sectionalization of opinion and interests was the very great ignorance of the two sections of each other. The main line of migration, travel and commerce were east and west instead of north and south. This situation promoted ignorance and ignorance promoted suspicion and hate. The result was that people of the extreme North and of the extreme South had the most exaggerated notions of the characters, manners and views of the other. From these portions of each section came the bitterest partisans in the conflict. There was little toleration in their views. But the people who neighbored across "Mason and Dixon's Line" were very different in their attitude. Their position was born of personal experience. They knew each other and knew that men on opposite banks of the Ohio River were really more alike than different. Whatever of moderation there was in the conflict was largely due to the people of the border States. Does not this justify the conclusion that if the two sections had really known each other the contest would have lost much of its bitterness and might have taken another form, and the controversy have ended short of war? Certainly the nation paid a dear price for its partisanship and sectional bitterness.

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32. SECESSION. The secession of 11 Southern States of the American Union during the winter and spring of 1860–61 is the most significant fact in American history after the adoption of the Federal Constitution. It was the one great attempt to make of the United States two republics instead of one, and the struggle which it precipitated decided that this could not be and that the Federation of 1787–89 had become a nation.

Whether secession was a reserved right of the original members of the Union is the first inquiry that arises. From the reasoning of the founders of the national Constitution during the decades of fierce political controversy which followed the inauguration of the government one is compelled to believe that such right was considered as still residing with the States, though Madison gives strong grounds for the contrary opinion in the writings of his early as

well as his later life. As to whether this right was reserved it should be said that there is today a marked difference of opinion among historical scholars. That the States conferred whatever authority the Federal government had and that this central authority was strictly and specifically limited are propositions no longer seriously disputed.

The threat of Virginia and Kentucky in 1798 to prevent the enforcement of the Alien and Sedition Laws (q.v.) within their boundaries; the public declaration on the floor of Congress by leaders of New England public opinion in 1807 to 1811 that the commercial States would be justified in seceding from the Union; and the actual meeting of the Hartford Convention in 1814 to consider ways and means of resisting the national authority would all seem to establish the point that the right of secession was claimed by each of the two great sections of the Union. These incidents are of further importance because they occurred within the lifetime of many of the framers of the Constitution and because many of these "framers" publicly espoused the views thus enunciated.

The Supreme Court of the United States, however, began about 1810 to expound the Constitution in a spirit of healthy nationalism. Chief Justice Marshall repeatedly affirmed the doctrine that the central government was that of a nation and that the rights of the States must be subordinated to the requirements of an enlightened national policy. This attitude of the court was vigorously and solemnly opposed by the Supreme Court of Virginia in 1815. In the celebrated lawsuit of Martin v. Hunter's Lessee appeal had been taken to the United States courts by means of a writ of error. Judge Marshall, with the unanimous agreement of his colleagues on the bench, reversed the decision of the Virginia court and issued a mandamus on the latter to execute the decree of the former. The judges of the Virginia court now entered into a painstaking examination of the case and not only declined to honor the mandamus but declared in published opinions that the United States Supreme Court was usurping powers not granted and thereby encroaching on the rights of the States. The policy of the Supreme Court was repudiated and the authority of the State courts even in cases involving the interpretation of treaties with foreign powers was asserted and incidentally the sovereignty of the States was maintained as staunchly as in 1798 — the right of a State to judge of infractions of the constitutions being emphatically reasserted. The right of secession was not advocated in terms, but any one could see that this was only a step further in the process.

During the years 1815 to 1822 the leading men of Virginia, including ex-President Jefferson, constantly excited public opinion against what they declared to be the dangerous teaching of the national courts. Virginia took the position she had occupied in 1798–99. Madison, however, protested against this later Virginia view, but rather on the grounds of expediency than otherwise. Other States followed the example of Virginia. Clearly then it was not a settled question in 1820 and the aggrieved party, whether North or South, claimed rights which, in the last analysis, were equivalent to a withdrawal from the general compact.

What caused the matter to be more difficult of settlement was the fact that there was no final authority, no judge between the two parties. An infraction of the general Constitution, that is, a violation of the contract between the Union on the one side and the States on the other, was a matter that could not be satisfactorily determined since there was no outside tribunal whose judgment could be accepted as disinterested. Jefferson thought on the whole that the States should be the final judges; Madison inclined with the exception of a few years of his life to the opposite view, while both Washington and Hamilton had held that the national government was to be its own judge in such cases.

In 1832 South Carolina formally annulled the tariff laws of the Union and the State of Georgia had steadily refused to recognize the authority of the United States courts within her boundaries during a period of several years beginning with 1825. After the passage of the Fugitive Slave Law of 1850 and especially after the Dred Scott decision of 1857, many Northern States refused to obey the national authority and in various instances passed laws to prevent enforcement of the laws of the Union.

Further still actual secession was not unfamiliar to Americans. The counties of western North Carolina (new Tennessee), just prior to the formation of the national government, had formally declared their independence and then proceeded to establish a separate and independent government. This new sovereignty, called the State of Franklin, was successfully maintained for four years, 1784–88. Western Pennsylvania and northwestern Virginia made a similar attempt to secede both from their mother States and from the Federal Union in 1794; in 1805 to 1807 there was danger that Kentucky, Tennessee and parts of the Louisiana cession would withdraw their allegiance from a government which was thought not to be sufficiently jealous of Western interests. The principle of local autonomy and local sufficiency was so universally accepted in the various sections of the United States that such threats and outbreaks were not surprising; they were not thought to be positively unlawful. Yet public opinion supported the Executive in putting down the whisky "insurrection" as it was called and President Jefferson did not sacrifice his popularity by taking vigorous measures to prevent what appeared to be a dangerous movement led by Aaron Burr in 1806. In 1814 the strongest organs of public opinion in Virginia recommended the use of force against New England in case of secession and the terms of "traitor" and "treason" were frequently applied to leading opponents of the war with Great Britain. The vigorous and prompt proclamation against the proposed plan of South Carolina by President Jackson was a prominent cause of that leader's lasting popularity South as well as North. However, it was not quite decided then that a State could not withdraw from the Union, in which case, of course, no national law would have force within its jurisdiction. Calhoun, the author of nullification, did not at that time advocate secession. He relied on the Jeffersonian teaching of 1798,

that the State was the proper judge of the validity of a national law in so far as that State was concerned. The debate between Webster and Hayne brought to light the fact that a genuine national spirit had arisen in the North and that the conservative particularism of the earlier years had entrenched itself in the Southern States. Meanwhile economic forces had begun to crystallize in such a way that disunion seemed to offer advantages to the South.

When the fierce struggle over Missouri was waging certain strong and far-seeing Southern leaders who regarded negro slavery as essential to the Southern economic and social structure declared that the James River and the Kentucky-Tennessee boundary was a natural line of cleavage between two civilizations which were growing up within the bounds of the United States. John Randolph and Nathaniel Macon held this view and there were a few others who agreed with them. The Missouri Compromise was considered by them a great blunder, notwithstanding its Southern origin. They declared it a violation of the national compact. From this time forward the development of the cotton plantation as the typical Southern institution of everyday life caused negro slavery in the lower South to appear to be an absolute necessity. Climate, soil and social habit combined to raise the institution from the position of a necessary evil to that of a benevolent system working alike for the upbuilding of the slave and his master. The price of cotton regulated the price of the negro; and the demands of the world's commerce grew faster than the supply of cotton. The economic life of this section was centred in this industry, and the profits were so great that with a small capital the younger sons of the older families of the south Atlantic seaboard could become independent planters in a few years and in a decade or two they became masters of vast estates with hundreds of slaves. Three factors entered into the makeup of these fortunes: cheap lands, negro slaves and a demand for cotton. The supply of cheap lands seemed inexhaustible, the demand for cotton as already noted continued to increase, negroes alone were limited in supply and they died very rapidly in the cotton belt. Maryland, Virginia and the Carolinas began early to send their surplus slaves south; as the price mounted from $300 in 1820 to $1,000 in 1850 the stimulus to raising negroes increased and the immorality of the business appeared less evident. This is the development which brought unity of economic interest to all the Southern States from Virginia, at least, to Louisiana.

It was but a natural step after 1833 to combine the inherent Anglo-Saxon idea of local autonomy with the economic interest of this group of States. And the almost universal resort to agricultural pursuits caused the operation of the national tariff to appear sectional, favoring the manufacturers of other sections at the expense of the cotton growers, who, having no competitors in the world's markets, could not ask for protection as did the industrialists of the North and East. The tariff became the object of the Southerner's most determined opposition. In Virginia college students formed anti-tariff clubs, taking vows not to wear tariff-favored clothing. And it required but little invention to combine these ideas with those older ideas of State supremacy which had been so prevalent immediately after the Revolution. Nullification became secession and all the more rapidly since the great nullifier, John C. Calhoun, soon gave up the former for the latter constitutional doctrine.

All these forces tended to build up a peculiar civilization, a peculiar social system south of the famous Mason and Dixon's line. Heads of families became patriarchs with numberless dependents looking up to them for their daily bread, and these chiefs naturally assumed the leading rôles in State and local government. Government itself became a social affair and office-holding remained the badge of honor. These masters at home undertook quite as naturally the representation of their States in the national congresses and cabinet. And since three negroes out of every five were counted in the apportionment of representation in Congress, the owner of 500 slaves was equal in political power to 301 voters in the North. This had secured to the South a preponderance of influence in national legislation until about 1830, when the West and Northwest began to loom large on the horizon of the future.

Texas, embracing an area of 270,000 square miles, declared her independence in 1836. Mexico was unable to suppress the revolution. The great majority of Texans were from the Southern States; they were also slaveholders. A new State — Texas — entered the family of nations. It applied, however, for admission into the United States in 1837. This meant an expansion of the territory of the South. It might serve as a check-mate to the West should it fail, as was clearly evident, to co-operate with the South in party policy. But admission of the new State was opposed by the Northern representatives. After a struggle of several years the new State was finally admitted in 1845. This controversy embittered the sections of the country and threats of secession had been freely and boldly made in the South during the campaign of 1844 in case the new Territory should not be admitted.

Admission of Texas meant a declaration of war on the part of Mexico and war with that feeble and rather decrepit nation exposed a vast region of country stretching from Santa Fé to San Francisco to American conquest. In the war that ensued everything that could be desired was won. But not being content simply to despoil a weak neighbor the United States offered, by way of conscience salving, to pay for the territory so ruthlessly seized. When the bill authorizing the payment of a portion of the money came up in the House of Representatives David Wilmot of Pennsylvania offered his famous proviso (see WILMOT PROVISO), prohibiting the introduction of slavery into the country to be acquired. This aroused the ire of the Southern leaders, as was to have been expected. From 1847 to 1850, the date of the second series of compromises on slavery, the South was agitated as never before and in every State strong secession parties arose.

The South was ripening for a revolution. William L. Yancey (q.v.) of Alabama, had recognized this; he had given up his seat in the national House of Representatives in 1846 and from that time forth appealed to the people of

his State to yield nothing whatsoever to Northern sentiment concerning slavery. He demanded that all territory to be acquired from Mexico should be kept open to slave settlement, and a failure to protect slaveholders in their rights he declared to be a violation of the national compact. Yancey was a fiery orator not inferior in the control of popular passion to Wendell Phillips; he was in fact the Southern counterpart of Phillips. In 1848 he prevailed on the Alabama State Democratic Convention to adopt his ideas which soon became known to the country as the "Alabama Platform." At the National Democratic Convention of that year Yancey presented resolutions embodying the Alabama platform; they were rejected and Yancey withdrew from the convention. Lewis Cass was nominated for the Presidency on an evasive platform. Yancey canvassed Alabama urging rejection of Cass. Gen. Zachary Taylor, the Whig candidate, was elected President. In 1850 when the agitation came to an issue in Congress on the question of the admission of California, Yancey advocated the secession of all slave-holding States.

In February 1849 the Virginia legislature declared almost unanimously that the Wilmot Proviso, if passed, would meet with "resistance at all hazards and to the last extremity" in that State. South Carolina followed with a recommendation for a convention of the Southern States; 3 Oct. 1849, Mississippi held a Southern rights convention which embodied the principles of the Virginia resolutions in an address to the people. As a result of this agitation Southern rights associations and committees of correspondence were organized in every section of the South. Throughout the North public opinion was crystallizing against the South on the subject of slavery; leading men were opposed to what was termed a "further surrender to Southern demands."

When Congress met, all the subjects in dispute were summed up in the proposed "compromise of 1850" (q.v.). The South was thoroughly aroused. The Mississippi delegates in Congress unanimously asked their State legislature for instructions how to vote on the compromise measures. The reply was a condemnation of the proposed compromise and the election of delegates to the Nashville Convention to be held on the first Monday in July 1850. South Carolina followed suit. The other Southern States in irregular manner chose delegates to the Nashville Convention. But when the representatives came together they proved to be conservative. Formal protests against the principal items of the compromise bill still pending were voted; but no threats were offered and the body adjourned to meet on the call of the president, who was a Whig and supposedly not unfavorable to Henry Clay's last great scheme. The convention never met again. This meeting had been intended on the part of South Carolina and, perhaps, Mississippi, as the first great step toward concerted action on the question of secession. It failed. The secessionists were still in a minority in all the Southern States except South Carolina and possibly Mississippi and Texas. Congress after much angry debate passed the "compromises." The abolitionists of the North declared that the cause of humanity and good morals had been betrayed. Their speakers were applauded when disunion was threatened or when it was asserted that the Fugitive Slave Law, one of the items of the compromise, could not be enforced. Nearly all senators from the Southern States signed a formal protest against the compromise and had it published in the record.

Co-operation among Southern States having failed, separate State action was now recommended, and South Carolina led off with a State convention in 1851, but failing to get a two-thirds majority in that body the secession party failed again. The agitation was continued. In Georgia, Alabama, and Mississippi, States Rights conventions were held and resolutions still looking to secession were adopted. In the elections which ensued in all the Cotton States the extremists were so badly beaten by a combination of Whigs and conservative Democrats that the movement was given up and the compromises were acquiesced in. Even Robert Barnwell Rhett (q.v.), the arch-secessionist of South Carolina, gave up the fight, resigned his seat in the United States Senate and retired to his plantation.

Notwithstanding the opposition in the North to the Fugitive Slave Law, and the persistent discontent and agitation of such men as Yancey in the South against the so-called unequal opportunity of slaveholders in the Territories, the sober element of the country accepted the compromises of 1850. The election of 1852 confirmed this view. The Democrats, who had come to be the conservative party of the nation and who emphasized the importance of quieting both the abolitionist and pro-slavery agitation, elected their candidates almost without opposition. The President, Franklin Pierce, chose his Cabinet from both North and South; he without any doubt meant to "let sleeping dogs lie."

However, the country was at heart divided, and when the administration paid $10,000,000 to quiet the claims of Mexico to lands on our southwestern frontier it was taken by serious and conservative people as a sign that the South was really in the saddle and that the slave-expansionists meant to make use of their position; but later when the bill for the erection of the portion of the Louisiana Purchase territory now known as Kansas and Nebraska into a Territory came up it was impossible to prevent the representatives of our two civilizations from renewing the struggle for supremacy. Senator Douglas thought to solve the whole problem by enacting a law giving both sections of the country equal chances to win possession of new States, that is, the newcomers, whether pro- or anti-slavery in sentiment and practice, were to be protected by national law until the population of the new Territory had grown large enough to be admitted as a State into the Union. In the formation of a State constitution the question of slavery was to be settled according to the interests and wishes of the majority. This was local or "squatter sovereignty" (q.v.), as it was called. The advocates of this scheme thought it would please the North because that section would feel certain that her teeming population of free emigrants would secure to her the control of the new States. The South would have all cause of complaint removed because she would at least have the opportunity to plant her

standards in all the common territory without official interference and under the guarantee of national protection.

But this meant the repeal of the Missouri Compromise (q.v.), by this time a sort of fetich in the eyes of the majority of people in the Northern States. It also meant the undoing of the now accepted legislation of 1850. But a strong party arose declaring that the Missouri Compromise was itself unconstitutional — the idea advanced by John Randolph and a few of his friends in 1820. The press of the South almost without exception joined in the demand for the open and formal repeal of the compromise legislation and for the adoption of the popular sovereignty plan. The Cabinet approved the new and radical departure and during the spring of 1854 Congress debated and passed the Douglas bill by large majorities and the President made it a law on 30 May 1854.

Immediately Kansas and Nebraska (q.v.) became the battle-ground of the two parties and in every State the war of words was waged hotter than ever. During the summer of 1854 "anti-Nebraska men," as they were called, met together in their various States and formed local organizations. They were able to secure the election of 103 members of the national House of Representatives and 15 senators. The new party, made up of remnants of all the older parties and embracing not a few abolitionists, took the name of Republican and declared unceasing warfare on the further spread of slavery. The next year it polled 114 electoral votes as against 174 for the Democratic candidate.

The Democratic party from 1852 to 1860 accepted either positively or negatively the chief tenets of the Southern constitutional theory: (1) State rights, (2) low tariff, (3) non-interference with the expansion of the slave power. The party was in the main dominated by Southern men. During the Pierce administration, in addition to negotiating the Gadsden Purchase (q.v.), and repealing the Missouri Compromise, the leaders of the Democratic party committed the country to the annexation of Cuba even by force if necessary and the administration failed to punish Southern filibustering expeditions directed against Mexico and Central America. President Buchanan in 1857 publicly endorsed the aggressive Democratic policy. He called to his council board such pronounced pro-slavery men as Howell Cobb, Jacob Thompson and John B. Floyd, and he relied too much upon these men for advice in every crisis, which was but natural, since so few Northern States had cast their electoral votes for him.

In the South during these years the aggressive sectionalists continued to urge the people on to secession as the only guarantee of their safety. Commercial conventions which discussed politics met each year in one of the larger Southern cities. These bodies recommended the boycotting of Northern manufactures, the encouragement of direct trade with Europe, the reopening, even, of the African slave trade. The Southern press took up the program and kept the agitation of sectional issues at the highest pitch of excitement. Parents were criticised for sending their sons to Princeton and Yale to be educated; State legislatures were urged to establish and generously support military schools. Secession was often and in all sections of the South threatened in the event that the Republican party should succeed in electing a President.

In 1857 the Supreme Court added fuel to the fire by going out of the way to declare that Congress could not lawfully interfere with slavery in any Territory of the United States and that any slaveholder must be protected in his rights in all sections of the country. (See Dred Scott Decision). The result in the North was the immediate supremacy of the Republican party, whose one idea was that slavery should not be permitted to expand, but should be limited to the States in which it had prevailed for years. Lincoln expressed the view of the advanced thought of the North when he said this nation cannot long endure "half slave and half free"; it must become all one or all the other. His program was that steps should be taken to fix the bounds of the institution and to assure the nation that slavery was under process of final extinction. He was nominated as the Republican candidate for the Presidency in Chicago in May 1860, and elected the following November.

The Democratic party still insisting on its conservative, free trade, pro slavery program, met in Charleston, S. C., in April 1860. After some attempt on the part of some Eastern men to nominate Jefferson Davis on a Douglas platform and on the failure of Yancey to get his famous "Alabama platform" adopted the convention split asunder, the Southern extremists following Yancey out of the convention hall in dramatic fashion, the Douglas men adjourning to meet again in Baltimore in June. Attempts were made during the succeeding months, especially after the nomination of Lincoln, to reconcile the two wings of the convention and thus unite on a candidate, but to no avail. The two branches of the Democratic party met in Baltimore and nominated separate tickets, the Northern men naming Douglas and Johnson, of Georgia, and the South putting forth Breckenridge and Lane on an aggressive pro-slavery platform.

An exciting campaign was waged throughout the country. In the South Yancey was the principal orator. He had finally brought his section to accept the program which he had written for the Democrats of Alabama 12 years before; his powers of speech, the evident sincerity of motive which animated him and the universal interest in the campaign gave him vast audiences everywhere. Every Southern State but three voted as he asked and in the States which did not support him his party strength was very great. Douglas canvassed the North manfully, but he received the vote of but two States, New Jersey and Missouri. Lincoln received the majority of the electoral vote.

It was generally understood among Southern politicians that South Carolina would promptly secede in the event of a Republican victory. The Gulf States were expected to follow suit. The South Carolina plan was the same that Barnwell Rhett had urged in 1850–51 and Rhett, having been some years now the editor of the Charleston *Mercury*, had come forward again the leader of a State completely converted to his way of thinking. The Palmetto State seceded by unanimous vote of a conven-

tion of her ablest men on 20 Dec. 1860. By 6 Feb. 1861, the tier of Southern States from South Carolina to Texas withdrew their allegiance from the Union and reassumed the sovereign powers which had been surrendered to the national government.

The agricultural life of the South had developed slavery as a fundamental factor in her economic life; on this basis had been erected a feudalism of a high order, a social system unique in modern times. To protect this system from the hostile encroachments of an unsympathetic outside world, the leaders of this section had since 1820 entrenched themselves behind the popular doctrine of States rights. Accepting this dogma without question the State of South Carolina made a single-handed fight in 1833 against the national tariff system as based on false interpretation of the national compact. The nation gradually adopted the Southern view and steadily lowered the tariff duties until in 1857 the country was placed practically on a free trade basis. Constantly threatened by representatives of Northern and Eastern States with the declaration that "slavery must go," the champions of this new feudalism had accepted the issue with the aggressive North on the slavery question in the hope of winning again. Failing in this secession was resorted to as the only alternative.

South Carolina sent commissioners to Washington to negotiate with the President concerning the delivery of Fort Sumter and other property of the United States within the bounds of the seceded State. President Buchanan declined to receive them, but indicated a strong desire to avert hostilities. South Carolina demanded the surrender of the forts she claimed as her own. Meanwhile the State of Virginia had procured the assembly of a Peace Convention with the aim of bringing about a compromise. This failed to get consideration in Congress which had met in regular session. Then Senator Crittenden of Kentucky proposed his scheme of pacification; this failed to satisfy either the extreme Republicans or the determined secessionists, and events were left to shape themselves until the incoming President should be installed.

A convention of Southern delegates met at Montgomery on 4 Feb. 1861 to draw up a provisional constitution. This work was done in a few days and Jefferson Davis of Mississippi, recently a distinguished senator in Congress, was elected President, with Alexander Stephens of Georgia, for Vice-President. The new Constitution was in most points quite like that of the old Union, the changes, with a few exceptions, being improvements on the old. This government went into operation at once, the United States forts and arsenals within the bounds of the confederation being promptly seized and strengthened for the benefit of the new Union of States. Secession was a *fait accompli.*

But from December 1860, to April 1861, the Northern people were anxiously debating the question whether there was a nation and whether this nation could coerce a seceded State or group of States. The firing on Fort Sumter on 12 April 1861 by the Confederate and South Carolina authorities decided these questions in the affirmative. President Lincoln called for troops to suppress what he called a revolt. This call forced Virginia, North Carolina, Tennessee, Arkansas, Kentucky and Missouri to decide on which side they would cast their lots; the two last named States determined to remain neutral; Virginia, North Carolina, Tennessee and Arkansas all before the middle of June joined the Confederacy. The capital was removed to Richmond; armies were rapidly enlisted; diplomatic agents were sent abroad; a regular government succeeded the provisional without serious friction. But the people of the Northern States had decided that a breaking up of the Union was unthinkable, criminal, treasonable and as such must be suppressed. The war began in earnest, and four years later all parties agreed to a peace which denied forever the right of secession, which yielded to the Union the constitutional right to lay such tariffs as were deemed necessary by Congress and which abolished African slavery forever and destroyed the social system which had been erected upon it. (See also SECESSION IN THE UNITED STATES).

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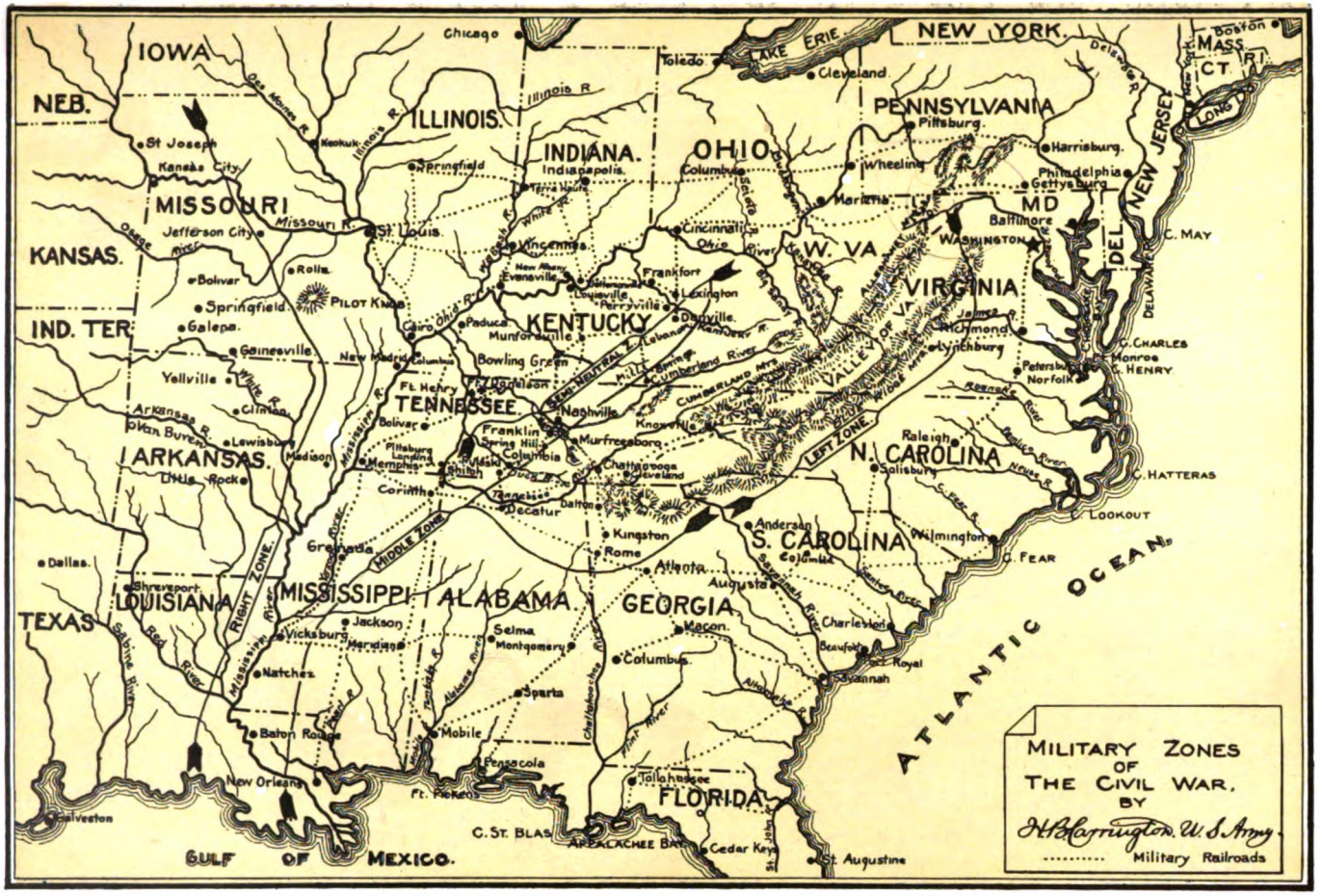
33. MILITARY EVENTS OF THE CIVIL WAR. The flag of the United States was first fired upon during the Civil War by some batteries erected against Fort Sumter in Charleston Harbor. The occasion was the appearance of the *Star of the West* on 9 Jan. 1861, off the harbor, bringing supplies of provisions from New York for Fort Sumter. This fort, under command of Major Anderson, was forced to surrender to General Beauregard 14 April 1861. Thereupon President Lincoln issued a proclamation calling for 75,000 volunteers. In the spring of 1861, after some skirmishes between Union forces and Confederate troops dispatched to western Virginia to hold that section within the Confederate lines, West Virginia seceded from Virginia and passed permanently into the Union lines. In July the army in front of Washington, under General McDowell, prepared to advance against the main Confederate army, under General Beauregard;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Military Railroads

and the encounter took place on the 21st at Manassas, where, on the arrival of the last brigade of Johnston's army, Beauregard's attack upon the Union flank turned McDowell's advance into a disorderly retreat, the army fleeing back to Washington. This signal defeat of the Union arms produced great mortification and consternation at the North. But the South was correspondingly elated and regarded this brilliant victory as an augury of the ultimate success of the Confederate cause. Both sides now proceeded to make more vigorous preparations.

General McClellan was summoned from West Virginia and given command of the Department of the Potomac, and forthwith he set about organizing the troops rushing in from all parts of the North. On 20 August he took command of the Army of the Potomac, now first organized under that title, and 1 November he was appointed commander-in-chief of the armies of the United States, superseding Gen. Winfield Scott, who was retired, at his own instance, because of failing health. After the battle of Bull Run but little hard fighting occurred during the remainder of 1861. Both sides contented themselves with establishing their respective lines. On 15 August President Davis ordered all Northern men to leave the South within the next 40 days. President Lincoln thereupon proclaimed the seceded States in rebellion and prohibited all intercourse.

Early in 1862 the Confederate line through Kentucky was broken by separate attacks under General Thomas and General Garfield. On 6 February Admiral Foote's fleet, with the aid of General Grant's forces, captured Fort Henry on the Tennessee, and Grant then moved on Fort Donelson and forced it to surrender, 16 February, with 15,000 men. On 7 April General Pope captured Island No. 10. About the same time Gen. A. Sidney Johnston, with headquarters established at Corinth, attacked Grant awaiting Buell, at Shiloh Church, near Pittsburg Landing. Johnston was killed, and Beauregard in command of the Confederates was driven back by Grant and Buell, who had meanwhile joined him. Defeated, Beauregard returned to Corinth. The Federals now began an advance on Corinth. The Confederates ordered Price and Van Dorn from west of the Mississippi to defend the city; but on Halleck's drawing near Corinth, it was learned that the Confederates had already evacuated it. General Bragg, who had succeeded Beauregard, proceeded to Chattanooga by way of Mobile, forcing Buell meanwhile to withdraw to the Ohio to protect his department. At the same time Gen. E. Kirby Smith invaded Kentucky, and defeating the Federals at Richmond on 30 August, he threatened Cincinnati. Thereupon Buell advanced from Louisville against Bragg, who, as a result of the battle of Perryville on 8 October, was compelled to abandon Kentucky.

In September Price and Van Dorn advanced against Grant and Rosecrans, near Corinth, and were both defeated. After this campaign Rosecrans was sent to relieve Buell in command of the Army of the Cumberland, 30 October. On assuming command Rosecrans concentrated his army at Nashville. On 26 December he moved toward Murfreesboro to attack Bragg, and there ensued a three days' battle ending 2 Jan. 1863. Rosecrans occupied Murfreesboro, and Bragg retreated to Shelbyville, Tullahoma and Wartrace. Both armies then went into winter quarters. On 8 March 1862 the Union fleet in Hampton Roads was attacked by the Confederate ironclad *Merrimac,* which inflicted heavy loss. However, on the following day the *Merrimac* was met by the *Monitor* and, after a severe engagement, retired to Norfolk, where she was blown up at the evacuation of that city by the Confederates, 9 May. The Western rivers, too, were the scene of some active naval engagements. Farragut's fleet did effective work on the Mississippi, taking New Orleans 1 May, and a little later Baton Rouge and Natchez. The Confederate flotilla under Commodore Montgomery was destroyed by Commodore Foote's fleet, in a desperate fight before Memphis, 6 June; and Memphis surrendered to the victorious fleet. At Galveston, however, the Confederates under Magruder, with the aid of an ordinary river fleet, won a brilliant victory; and the *Alabama* (which was sunk by the *Kearsarge* off Cherbourg in 1864) captured the gunboat *Hatteras.*

In March McClellan, who had been lying inactive so long, began his noted Peninsula campaign which terminated in utter failure. His advance was opposed by Gen. J. E. Johnston, who gradually fell back toward Richmond till he reached Seven Pines, or Fair Oaks. Here the armies met on 31 May. The timely arrival of Sumner's corps from the other side of the Chickahominy saved McClellan from serious disaster. Johnston being badly wounded, Gen. G. W. Smith succeeded to the command temporarily. On 2 June Gen. R. E. Lee was assigned to the command of the Army of Northern Virginia, which he retained till the close of the war. Gen. "Stonewall" Jackson (q.v.), by a brilliant campaign in the valley, in which he defeated Banks at Winchester, forcing him across the Potomac, Frémont at Cross Keys, and Shields at Fort Republic, held most of McDowell's corps around Fredericksburg, thus preventing them from joining McClellan, and himself suddenly appeared, 25 June, at Ashland, on the flank of McClellan's army in front of Richmond. Thereupon followed the Seven Days' battles, beginning with Mechanicsville 26 June, and including Gaines' Mill and Malvern Hill, after which McClellan withdrew to Harrison's Landing on the James. The campaign proved a disastrous failure; and McClellan, having been relieved, 11 March, of the general command of the armies, now retained that of the Army of the Potomac and saw Halleck assigned to the chief command, 23 July.

After the withdrawal of the Army of the Potomac to the James, McClellan, against his protest, was recalled from the Peninsula to the vicinity of Washington. General Pope was now ordered to organize the corps of McDowell, Banks and Fremont into the Army of Virginia, to cover this movement and to protect Washington. With this army Pope advanced against the Confederate forces near Gordonsville, where, confronted by Lee and Longstreet, he retired behind the Rappahannock and was defeated at the second battle of Bull Run, 30 August. He then withdrew to Centreville, where he was reinforced by the corps of Sumner and Franklin from McClellan's army. His flank was attacked by Jackson at Chantilly. On

2 September Pope was recalled with his army to Washington and was relieved of his command, his forces being added to the Army of the Potomac under McClellan.

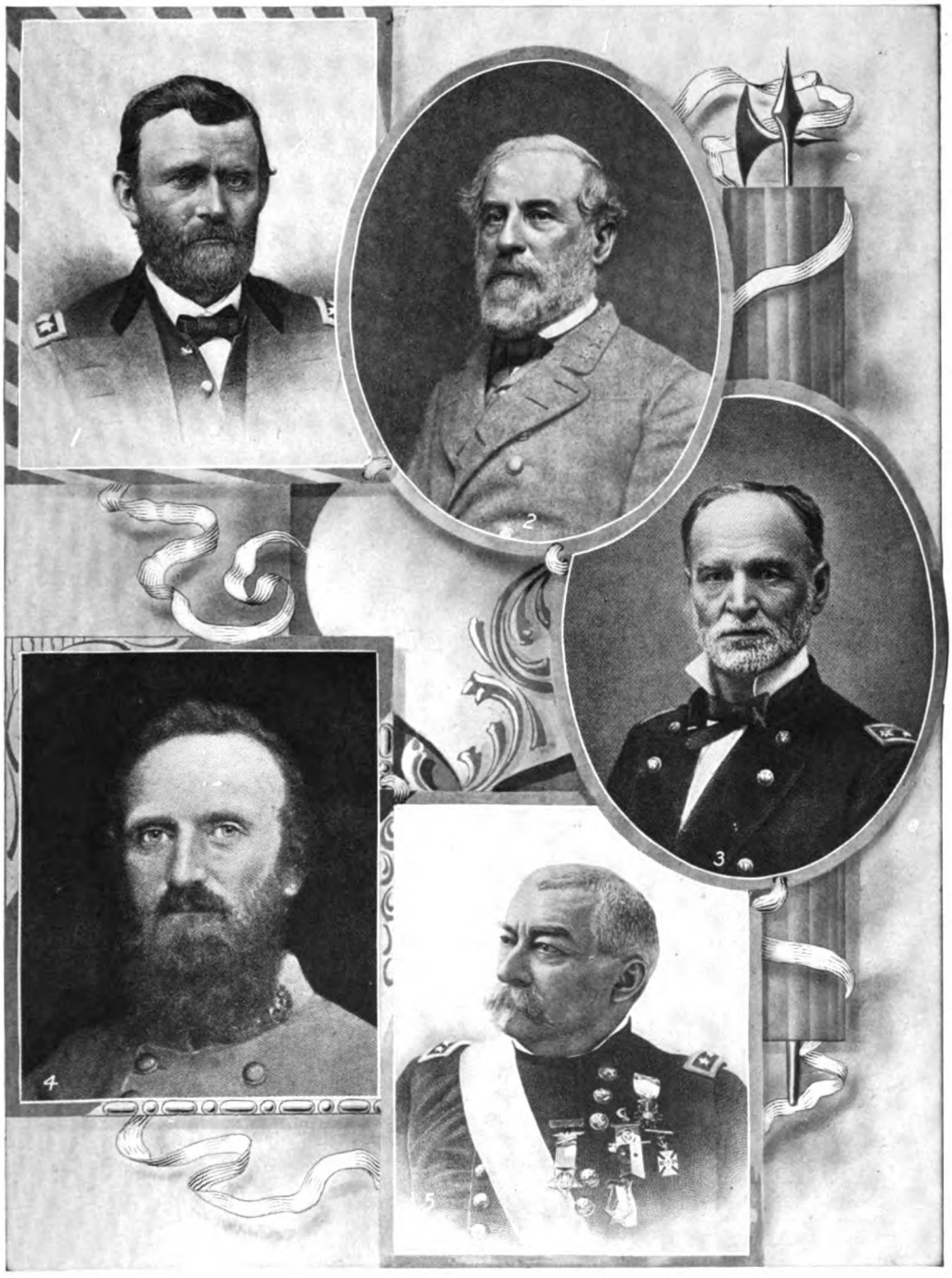
In September Lee set out for his invasion of the North, crossing the Potomac near Leesburg and moving toward Frederick. He captured Harper's Ferry and advanced to Hagerstown, thence retiring to Sharpsburg, where he was met by Hooker's corps of McClellan's army. A desperate fight ensued, 17 September in which the losses were greater for one day's fighting than in any other battle of the war. Lee then withdrew across the Potomac, McClellan's army following him into Virginia, and resumed his position beyond the Rappahannock. Near Warrenton McClellan was superseded, 7 November, by Gen. Ambrose E. Burnside. Burnside took his position opposite Lee's army near Fredericksburg, and on 13 December attempted to cross the Rappahannock and assault Marye's Heights, only to be repulsed with terrific slaughter. The following month he undertook to cross the river above Fredericksburg and turn Lee's left, but the attempt proved a dismal failure, being known as the great Mud March. Thereupon Burnside was relieved of his command and was succeeded by Hooker, 26 Jan. 1863.

The winter of 1863 was spent in laborious, though fruitless efforts to capture Vicksburg, which, because of its strategic importance, the Confederates held strongly fortified. Grant and Sherman both failed. At length, in April, Grant began his second move upon the city from the south and east. Admiral Porter's fleet convoying the transports ran the batteries on the night of 16 April, and the advance of the army crossed the river, 30 April. On 1 May Port Gibson was captured and Grant had forced his way to the rear of Vicksburg. Preventing a junction of Pemberton's and Johnston's forces, Grant defeated the former at Champion's Hill, and again at Big Black Ridge, 18 May, pursuing him into Vicksburg. After two unsuccessful assaults upon the fortifications, Grant undertook the siege of the city, which surrendered, 4 July 1863. This event was a turning point in the war in the West, hardly less important than Gettysburg in the East. Hooker opened the campaign of 1863 in the Army of the Potomac by crossing the Rappahannock at Fredericksburg and advancing to the Rapidan. At Chancellorsville the Union right was disastrously routed by Jackson's corps, 2 May. In the night, while reconnoitering before his pickets, Jackson was mortally wounded by his own men, who mistook him for the enemy. On the following day Hooker was forced back, with heavy loss, and recrossed the river, 5 May. Hooker being utterly defeated, Lee set out from Fredericksburg, on 3 June, for a second invasion of the North. The advance under Ewell, after some minor engagements in the valley, crossed the Potomac at Williamsport, 15–16 June, and moved on to Chambersburg and the vicinity of Harrisburg and Columbia, capturing York on 28 June. Ewell was then ordered to fall back to Gettysburg, where Lee was concentrating his army. The Army of the Potomac under Hooker had advanced meanwhile to Frederick, where Hooker requested to be relieved; and Meade was assigned to the command. The two armies encountered each other at Gettysburg and after a three days' battle, 1–3 July, Lee retreated and recrossed the Potomac, without a battle. After a month's rest in the Shenandoah, Lee resumed his former position below the Rappahannock, Meade following him thither.

The campaign of 1863 in the Army of the Cumberland had as its objective the recovery of middle Tennessee. Rosecrans forced Bragg from his lines along the Duck River; and Bragg retreating over the Cumberland crossed the Tennessee and arrived in the vicinity of Chattanooga. The Union line being advanced to the western base of the Cumberland, a campaign against Chattanooga was begun. Grant, now assuming general command of the military division of the Mississippi, arrived 23 October; and with the Army of the Cumberland under Thomas and with a force from Vicksburg under Sherman and one from the Army of the Potomac under Hooker, Grant fought and won the battles of Lookout Mountain and Missionary Ridge, 24–25 November, and forced a general retreat of the Confederates, thus securing Chattanooga to the Federals. Knoxville, held by Burnside, was besieged by Longstreet, who, when Sherman approached, retreated to Virginia. In the meantime Charleston Harbor was the scene of a formidable attack and brillant defense, and on 16 November the city was bombarded.

On 12 March 1864 Grant, now commissioned lieutenant-general, was placed in command of all the Union armies. He planned a combined movement of the armies: Gilmore from South Carolina to join Butler at Fort Monroe for a move up the James to capture City Point, threatening Petersburg and Richmond; Burnside with an army from Annapolis to join Meade in command of the Army of the Potomac and advance against Lee's right to Richmond; Sherman, with the Army of the Cumberland under Thomas and the Army of the Tennessee under McPherson and the Army of the Ohio under Schofield, to move against Johnston's army at Dalton; and Banks, leaving the Red River country to Steele and the navy, with his army to move against Mobile. Grant operating with the Army of the Potomac under Meade, 119,000 strong, crossed the Rapidan, 4 May 1864 and met Lee with 62,000 men in the Wilderness, and a great battle followed, 5–6 May. At Spottsylvania Court House both armies entrenched and from 8–20 May there was terrific fighting. Grant then moved toward the North Anna. Meanwhile, Sheridan, commanding Grant's cavalry, made a raid around Lee's army and met and defeated J. E. B. Stuart at Yellow Tavern, where Stuart was killed, 11 May. Grant's advance was opposed by Lee and desperate fighting occurred at North Anna and Bethesda Church. At Cold Harbor Grant attempted an assault along his entire line, only to be repulsed with a sickening slaughter, 3 June, and so failed to interpose between Lee and Richmond. But Sheridan, who had been sent against Fitzhugh Lee's and Hampton's Cavalry, in the meantime defeated both at Trevilian's Station. Grant now moved toward the James, crossing at City Point and Bermuda Hundred now occupied by Butler.

Grant established his lines before Peters-



AMERICAN GENERALS

1 U. S. Grant 2 Robert E. Lee 3 William T. Sherman
4 Thomas J. (Stonewall) Jackson 5 Philip H. Sheridan

burg and notwithstanding his heavy fighting till 1 November (the mine explosion and battle of the Crater occurred 30 July), Lee's lines remained unbroken. Sigel's campaign in the Shenandoah ended in defeat at New Market, 15 June, and he was superseded by Hunter, whose movement against Lynchburg was repelled by Early. Early then invaded Maryland, threatening Baltimore and Washington, 11 July, after which he was compelled to retire across the Potomac. Again he advanced into Pennsylvania and burned Chambersburg, whence Sheridan drove him back into Virginia beyond Staunton and devastated the valley. Sherman moved against Johnston at Dalton early in May, and Johnston, stubbornly resisting, fell back to Atlanta. Johnston was succeeded by Hood, who, after several unsuccessful battles, evacuated Atlanta and invaded Tennessee, only to be thoroughly defeated by Thomas at Nashville, 15–16 December. Sherman occupied Atlanta 2 September, and after Farragut's brilliant naval victory in Mobile Harbor made his famous march through Georgia to the sea, occupying Savannah 21 December.

Early in 1865 the closing campaigns of the war opened. Terry, co-operating with Admiral Porter, captured Fort Fisher, 15 January. On 1 February Sherman started north from Savannah, captured Columbia, after which event Charleston was evacuated, and on 19 March met Johnson whom he defeated after a sharp battle. In Alabama, Wilson, operating under Thomas, captured Selma with its immense war supplies, 2 April, and defeated Forrest's cavalry. The Army of the Potomac, the last to move in 1865, began a general movement to the left, 29 March; and there followed the battles of Dinwiddie Court House and Five Forks, 31 March and 1 April. On 2 April the Confederate entrenchments were carried and Petersburg was evacuated; Lee, abandoning his lines held so long against such heavy odds, began a retreat to Amelia Court House. After the fall of Richmond on 3 April, Grant, with his entire army under Meade and Sheridan, pursued Lee and forced him to surrender at Appomattox, 9 April. The number paroled was 28,231, all told, the worn-out remnant of Lee's brave and noble Army of Northern Virginia. In North Carolina Sherman and Schofield moved against Johnston, who occupied Raleigh, and compelled him to surrender on 26 April 1865. This was the end of the war. See CIVIL WAR; also accounts of various battles and engagements under their respective titles. For *bibliography*, see special article on CIVIL WAR IN AMERICA, Vol. VII, pp. 6 to 20.

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34. THE CONFEDERACY. When the election of Mr. Lincoln by the practically unanimous vote of the free States was announced in the autumn of 1860, the slave States of the lower South made preparations to exercise what they regarded as their constitutional right of seceding from the Union. The Republican party had triumphed on a platform which declared the Dred Scott decision of the Supreme Court to be a dangerous political heresy and which announced a determination to exclude slavery from the Territories. This platform was regarded by the South as the culmination of a long line of grievances; its triumph seemed to justify secession. It is true that the Republicans were still in the minority in both houses of Congress and on the Supreme bench; but the election showed the increasing power of that party and pointed to its ultimate success. It is now evident that it was folly for the South to suppose that secession would be successful, but if it was to be attempted, the South showed great political sagacity and foresight in not waiting longer. The anti-slavery sentiment had been growing apace in the North, and to the writer the autumn and winter of 1860–61 seems to have been precisely the time to strike for a separation. The South, weak though it was, was stronger than it could have been at any subsequent period. This point should not be obscured by the disastrous consequences of secession. However this may be, it now seems clear that the slavery question, in its various phases, was the principal, if not the only, cause of secession, and, in its turn, secession was the cause of the war. This was the view taken by Vice-President Alexander Stephens after the war had begun — a view not inconsistent with his declaration before the war (21 March 1861) that "slavery was the cornerstone of the new Confederacy." This latter statement, it may be added, is often quoted by those who forget that 25 years before in the case of Johnson v. Tompkins, Judge Baldwin of the Supreme Court said: "Thus you see that the foundations of the (Federal) government are laid and rest on the right of property in slaves. The whole structure must fall by disturbing the corner-stone." The struggle on the Northern side, therefore, was primarily to resist secession and to preserve the Union. Subsequently the destruction of slavery was included in the program. On the Southern side, while the opposition of the Republicans to the extension of slavery in the Territories, the "personal liberty laws," and the reproaches of the North touching the iniquity of the institution, carried all but the border States into secession, the active force in the war that followed this rash act was not so much the preservation of slavery as it was the determination to resist invasion and to maintain the right of secession or the right of revolution. The motive that led to secession was replaced by the motive of resistance to coercion. Thus can be explained the heroism and sacrifices of the four-fifths of the Southern people who owned no slaves.

On 4 Feb. 1861, a Congress of delegates from all the States that had seceded met in Montgomery, Ala. At this date only six States had left the Union: South Carolina, 20 Dec. 1860; Mississippi, 9 Jan. 1861; Florida, 10 January; Alabama, 11 January; Georgia, 18 January; Louisiana, 26 January. In Texas the ordinance of secession was not passed until 5 February, and it had still to be submitted to the people. The Texan delegates, however, arrived in Montgomery before this final ratification. All the delegates were elected by the same conventions that had passed the ordinances of secession.

The Montgomery Congress immediately proceeded to form a provisional government. On 8 February it adopted a provisional constitution, differing in some important particulars

from the Constitution of the United States. Under this Constitution, which, being provisional was not submitted to the States, the delegates elected a President and a Vice-President of the Confederate States of America, each State being allowed one vote. By the unanimous vote of the six States present, Jefferson Davis of Mississippi was elected President and Alexander H. Stephens of Georgia, Vice-President. On the 18th, some three weeks before Mr. Lincoln was sworn in, these officers were duly inaugurated. The Constitution of this provisional government resembled so closely the permanent Constitution, to be described later, that its provisions need not be given. It was to continue in force for one year, unless altered by a two-thirds vote of Congress or superseded by a permanent government. A committee of two from each State represented in Congress having drawn up a permanent Constitution, this instrument of government was promptly adopted by the Congress 11 March, and being submitted to the seceded States was with almost equal promptness adopted by them. This was accomplished by action of the same conventions that had passed the ordinances of secession. Where these conventions had adjourned, they were reassembled for the purpose. In no case does there seem to have been any demand for the calling of new conventions to ratify the Constitution. It was thought important to organize the government as soon as possible.

In the meantime Congress had passed acts to raise provisional forces for the Confederate States, to authorize the President to borrow $15,000,000 at 8 per cent interest for the support of the government, to levy an export duty on each pound of cotton exported after 1 August and to organize the Post-Office Department. Courts were rapidly organized in the different States, but, as we shall see, the Confederate States never possessed a Supreme Court. The President was then authorized to receive from the various States such forts, arsenals and other public establishments with their contents as they had taken possession of within their respective limits. The request of the President to this effect met with prompt compliance on the part of the States. With the hope of obtaining recognition from foreign governments, commissioners were sent to European countries, but they were unsuccessful in their missions. England, France and other countries in the summer of 1861 acknowledged the belligerency of the Confederate States, but beyond this action they refused to go. A recognition of the independence of the new Confederacy would have been regarded by the United States as an act of hostility. In November 1861 J. M. Mason and John Slidell were sent as special commissioners to England and France respectively. After leaving Havana the English vessel in which they had taken passage was overhauled by the *San Jacinto* of the American navy, and these commissioners were forcibly removed. England demanded their restoration. The United States government at first hesitated, raising a hope in the Confederacy that war might ensue between the two countries. Finally, however, Lincoln said: "We fought England about this matter in 1812; we must give up these men." Accordingly the commissioners were placed on board an English vessel and allowed to continue their voyage. On the 8th of August the Confederate Congress, to please foreign powers, had adopted all the provisions of the famous Declaration of Paris, except as to the use of privateers.

The provisional government of the Confederacy had hardly been in force two months before it came into conflict with the United States government. The occasion of this conflict was the demand of the Confederate authorities that Fort Sumter in Charleston Harbor should be surrendered by the Union force that occupied it. Senator Douglas, though opposed to secession, had argued in the United States Senate that South Carolina was entitled to the possession of Fort Sumter; General Scott had advised its evacuation; and Secretary Seward had practically promised that it should be given up. The South, therefore, thought that a peaceable solution was in sight. But President Lincoln, after a period of indecision, decided to provision the fort, and on 8 April 1861 so informed the governor of South Carolina. The South had not desired hostilities; but the Confederate government thought it necessary to capture the fort and opened fire on it 12 April. This act precipitated war. The Confederate States, therefore, have generally been made to bear the odium of beginning hostilities. The question is debatable; for as Hallam says: "The aggressor in a war is not the first who uses force, but the first who renders force necessary." We are thus thrown back upon the question raised by Senator Douglas, which cannot be discussed here. The bombardment of Sumter stirred the North as by an electric shock. When on 15 April Lincoln called for 75,000 volunteers "to suppress combinations obstructing the execution of laws in seven of the Southern States," the free States rallied to his support. His determination, however, to coerce the Confederate States persuaded four of the border States, which had hitherto held aloof, to join the Confederacy. Arkansas seceded 6 May; North Carolina 20 May; Virginia 23 May, and Tennessee 18 June. Kentucky, Missouri, Maryland and Delaware having refused to secede, no more accessions were to come to the South. West Virginia, moreover, with a population of 250,000, detached itself from Virginia and remained loyal to the Union. The population of the Confederacy was about 9,000,000, of whom three and a half millions were slaves; while that of the Union States was approximately 22,000,000, an immense disparity of numbers. "Yet," said J. F. Rhodes, "had the North known that the people of the cotton States were practically unanimous, it might have refused to undertake the seemingly unachievable task; for while hardly a man in the North assented to the constitutional right of secession, all acknowledged the right of revolution. . . . Many would have objected to combating that right." The provisional Congress, being called together 29 April in Montgomery to consider the new condition of affairs, made provision for the prosecution of the war by adopting financial and military measures. On 6 May it passed an act, declaring that negotiations with the United States for a peaceable solution of difficulties had failed, and as Mr. Lincoln had called for 75,000 men to

capture forts within the jurisdiction of and belonging to the Confederate States of America, and had issued another proclamation announcing his intention to set on foot a blockade of the Confederate ports; and «whereas by the acts and means aforesaid war exists between the Confederate States and the government of the United States, and the States and territories thereof, excepting the States of Maryland, North Carolina, Tennessee, Kentucky, Arkansas, Missouri, and Delaware, and the territories of Arizona, New Mexico, and the Indian Territory, south of Kansas; therefore the president is authorized to use the whole land and naval force of the Confederate States to meet the war thus commenced and to issue letters of marque under the seal of the Confederate States against the vessels of the United States.» It was further provided in accordance with the Declaration of Paris (q.v.) that property of the enemy (except contraband of war) on board a neutral vessel should not be subject to seizure. In response to this declaration of existing war, a hundred applications for letters of marque were received from privateers, and troops crowded to the support of the new government with the same alacrity as in the North. On 21 May Congress adjourned to meet 20 July in Richmond, Va., now chosen as the permanent capital of the Confederate States. On 6 November an election was held under the permanent Constitution for President and Vice-President. As there was no opposition to Davis and Stephens, they were unanimously elected President and Vice-President respectively by the electoral votes of the 11 Confederate States. They were to enter upon their office 22 Feb. 1862, and to hold office for six years. Under the provisional government the President had appointed as members of his Cabinet Robert Toombs of Georgia, Secretary of State; C. G. Memminger of South Carolina, Secretary of the Treasury; L. P. Walker of Alabama, Secretary of War; John H. Reagan of Texas, Postmaster-General, and J. P. Benjamin of Louisiana, Attorney-General. At the close of 1861 J. P. Benjamin had become Secretary of War; S. R. Mallory of Florida, secretary of the Navy; ex-Gov. Thomas Bragg of North Carolina Attorney-General, and R. M. T. Hunter of Virginia had been appointed Secretary of State, vice Toombs, resigned. As the war went on, changes were made in the Cabinet as follows: On the resignation of Mr. Hunter, Mr. Benjamin in 1862 held for a time the portfolios of State and of War, until Geo. W. Randolph of Virginia was made Secretary of War. In the same year Mr. Randolph resigned and was succeeded by James A. Seddon of Virginia. Mr. Seddon resigned in the early part of 1865 and was succeeded by Maj.-Gen. John C. Breckenridge of Kentucky. In 1864 Mr. G. A. Trenholm succeeded Mr. Memminger as Secretary of the Treasury. Attorney-General Bragg was succeeded by Thos. H. Watts and subsequently by George Davis of North Carolina.

The provisional Congress, which was unicameral, expired 15 Feb. 1862, and the Senate and House of Representatives, elected under the permanent Constitution, met in Richmond 18 Feb. 1862. The members of this Congress were chosen from the most distinguished men of the South. «Of the 26 Senators, fourteen had been formerly members of the United States Congress, and in the lower house, out of 106, 33 had also represented the South at Washington.» Subsequently, in the course of the war, the character of the Confederate Congress in general ability declined, many of the best men joining the army. One very necessary department of the new government it was found difficult to organize. This was the post office. The position of Postmaster-General was offered by President Davis to Mr. Ellet of Mississippi and later to Mr. Wirt Adams of the same State; but both declined. Then J. H. Reagan of Texas, after twice refusing, was persuaded to accept the office. His reluctance was due to the fact that he knew the labor of organization would be heavy, and that if the mail facilities were inferior to those formerly furnished by the Federal government, there would be great dissatisfaction. But Mr. Reagan was thoroughly competent. He sent letters to Washington before the war began, and invited a number of clerks in the Post Office Department to take positions in the Confederate post office. All but two accepted. With their help organization proceeded rapidly, and on 13 May Mr. Reagan announced that on the first of June the Federal service would cease and the Confederate service would begin. All postmasters were required by that date to render their final accounts to the United States government, and were invited to continue their duties under the Confederate government. The Postmaster-General of the United States suspended the Federal service to take effect the same day. The permanent Constitution of the Confederate States required that the post office should be self-sustaining after 1 March 1863. In 1859–60 the United States had conducted the post office department in the States that were to form the Southern Confederacy at a loss of $1,941,425. Hence a radical change of management was necessary to meet the new requirement. Accordingly Postmaster Reagan persuaded the railroads to carry the mails at one-half the former rate and to accept the bonds of the Confederacy in payment. He raised the rate on packages, newspapers and letters, the postage on the last being fixed at five cents per half ounce for a distance of less than 500 miles and 10 cents for a greater distance. The franking privilege was abolished and mail routes considered unnecessary were reduced in number or discontinued. As a result of these and other radical changes, the reports of the Postmaster-General show that by the latter part of 1862 a surplus was obtained, and from that time on there was a net annual increase of receipts over expenditures.

The various States of the Confederacy made no changes in the organization of their judiciary system, but the provisional Constitution of the Confederacy provided that each State should be erected into a distinct judicial district, the judge having all the powers hitherto vested in the judges of the District and Circuit Courts; and that the several district judges together should compose the Supreme bench, a majority of them constituting a quorum. During the year 1861 these District Courts were organized, and they were continued under the permanent Constitution. Congress, however, passed an act 31 July 1861, providing that the Supreme Court should be organized only under the permanent Constitution. Accordingly, in the Congress that

met in 1862, the establishment of a Supreme Court was discussed, but nothing was done until the following year. In January 1863, Senator Hill in the Senate said: "I think it high time the judicial department of the government be thoroughly organized; for it has been a limping concern long enough." Finally, on 18 March 1863 the Senate passed a bill to organize the Supreme Court. This bill was intended to carry out the provisions for a Supreme Court as found in the permanent Constitution; provisions that were practically identical with those of the Constitution of the United States. The bill provided for a Supreme Court of the Confederate States to consist of a chief justice and four associate justices, any three of whom should constitute a quorum. The court was to hold annually at the seat of government two sessions, and its appellate jurisdiction was limited to appeals from the Confederate District Courts in the several States. Under a law passed by the provisional Congress (16 March 1861), it had been provided that the Supreme Court should also have jurisdiction in appeals from the State courts, "where was drawn in question the validity of a treaty or statute of, or an authority exercised under, the Confederate States; or where was drawn in question the validity of a statute of, or an authority exercised under any State, on the ground of their being repugnant to the Constitution, treaties, or laws of the Confederate States; or where was drawn in question the construction of any clause of the Constitution, or of a treaty, or statute, or commission held under the Confederate States." This law of the provisional Congress was significantly repealed in the Senate bill above mentioned. Whereupon the Richmond *Examiner* declared that a Supreme Court, without the circuit feature of the Supreme Court of the United States, and acting simply as a court of appeals from the inferior tribunals of the Confederation, could do no mischief and might do much good. "But had the original law been allowed to stand, prophetic inspiration was not necessary to foresee that the career of the Southern Confederacy would have been but a pursuit of the catastrophe which overwhelmed the late Union." The Supreme Court as thus constituted, however, never saw the light of day after all. The Senate bill, after having been twice read in the lower house, was referred (20 March 1863) to the Committee on Judiciary, and no further mention of it is to be found. There has been much discussion as to the reason why the Confederacy failed to establish a Supreme Court. It seems clear that the reason was twofold. The experience of the South with the Supreme Court of the United States had, in the opinion of many, been disastrous to State rights. Moreover, at this time the military exigencies were much greater than the judicial; hence it seemed wise to defer the establishment of such a tribunal to a more peaceable season. The absence of a Supreme Court, however, had its natural result. The Federal District Courts and even the State Supreme Courts interpreted the Confederate Constitution and in some instances declared the acts of Congress unconstitutional. When a Confederate court in South Carolina decided that Congress had no right to tax State bonds, the war tax on bonds was not collected in that State. The existence of a court of final resort might have aroused antagonism among the sovereign States; but it seems to have been necessary.

The permanent Constitution of the Confederate States, while providing in almost the same words for the same division of powers, differed from that of the United States in some important details. If a good case of infringement of copyright could be made out against the South, it is to be remembered that that section could claim a large share in the framing and wording of the original instrument. Nor did the South desire to draw up a new constitution. The intention was rather to make explicit certain States-rights principles that were held to be implicit in the old Constitution, and to make some additions which it was believed the experience of 70 years had shown to be necessary. Only the more important of the changes can be given here. In the preamble, instead of the ambiguous "we the people of the United States," is found "we the people of the Confederate States, each State acting in its sovereign and independent character in order to form a permanent Federal government." As an additional qualification of electors, it is declared that "no person of foreign birth, not a citizen of the Confederate States, shall be allowed to vote in State or Federal elections" (a restriction upon the previous powers of the States). Further changes were that any judicial or other Federal officer, resident and acting solely within the limits of any State, may be impeached by a vote of two-third of both branches of the legislature thereof. Congress may by law grant to the principal officer in each of the executive departments a seat upon the floor of either house, with the privilege of discussing any measure appertaining to his department (an excellent arrangement which, though practised under the provisional government, was never put into force by the Congress). The President may approve any appropriation and disapprove any other appropriation in the same bill. All taxes or importations shall be for revenue only; not to foster any branch of industry. The "general welfare" phrase of the Federal Constitution is omitted: taxes are to be laid for "the common defense and to carry on the government." The power of Congress to provide for internal improvements is limited. Congress is denied the right to emit bills of credit (legal tender). No bankrupt law must be retroactive. The African slave trade is forbidden. Taxes may be laid on exports by a two-thirds vote of both houses. Except in certain specified cases Congress can appropriate no money from the treasury without a vote of two-thirds of both houses. A State may lay a duty on the tonnage of sea-going vessels for the improvement of its rivers and harbors. When a river divides two or more States, they may enter into compacts with each other to improve the navigation thereof. The President and the Vice-President are to hold their offices for six years, but the President is not to be re-eligible. The President may at his pleasure remove the principal officer in each of the executive departments. All other civil officers of the executive department may be removed by the President or other appointing power when their services, etc., are unnecessary, or for incapacity, dishonesty, etc., and the removal with the reasons therefor shall be reported to the Senate. Citizens of any State shall have the right of

transit and sojourn in any State of the Confederacy with their slaves or other property, and the right of property in said slaves shall not be thereby impaired. The Confederate States may acquire new territory (a clause much desired by Jefferson in the original Constitution), and in all such territory the institution of negro slavery, as it now exists in the Confederate States, shall be recognized and protected by Congress and by the Territorial government. Amendmends to the Constitution are not be made through the initiation of Congress as in the old Constitution; but upon the demand of any three States, legally assembled in their several conventions, the Congress shall summon a convention of all the States to consider such amendments as may be proposed by the States. If these amendments are agreed on by the convention and are ratified by two-thirds of the States acting through their legislatures or conventions, they shall form a part of the Constitution. Finally the ratification of five States shall be sufficient for the establishment of this Constitution between the States so ratifying the same. Southern writers have very generally maintained that every point which differentiated this Constitution from its predecessor was an improvement on the latter. As to the correctness of this claim jurists will differ accordingly as they approve or disapprove of loose confederacies. Under this Constitution the Confederate government levied taxes, negotiated loans, raised armies and for several years carried on a terrible conflict. The test of the worth of a constitution, however, is its working in times of peace as well as in times of war. If this Constitution had been tested in times of peace, it is likely that it would have shown the fatal tendency of all confederacies to disintegrate when no external pressure holds them together. Nor will it be maintained that in time of war the Constitution proved itself a very efficient instrument. The States, endowed with fresh "sovereignty," were jealous of their rights and sometimes nullified the constitutional acts of the government. For such cases the Constitution spoke no word of coercion. On the other hand, while the government was clearly a confederacy, the exigencies of war compelled a concentration of power into the hands of the President and his Cabinet which grew into a military despotism. Congress protested, but grew feebler as the conflict became more desperate. There was friction between the legislature and the executive and between both and the States. Among the acts of the government that caused particular dissatisfaction may be mentioned the repeated suspension of the writ of habeas corpus down to 1 Aug. 1864; though Dr. Schwab has shown that this suspension was carried out with less stringency in the South than in the North. Other grievances were the severe conscription acts, the impressment of supplies for the army at fixed prices, the constant interference with interstate commerce and the issue of vast quantities of irredeemable paper money. This currency was never formally made legal tender as was done in the North, but it was practically forced upon those who sold supplies to the government. All these measures which may easily be paralleled in history, and which seem to have been rendered necessary by the dire necessities of the war, caused distress and met with opposition in some of the States.

The blockade of the Southern ports by the navy of the United States was so strict that the wealth of the South, its cotton and other crops, could not be sent abroad, save at fatal risk, in exchange for the munitions of war. In the early stage of the conflict there had been no desire to export the cotton. The strange delusion that "cotton is king" was so widespread that it was thought possible to compel England to recognize the Confederacy by withholding from her the great staple. When, however, the fallacy of this embargo was as clearly seen as once before in our history, both the Confederate government and some of the State governments utilized the blockade runners to send cotton abroad to exchange for the thousand and one things which the South, from lack of industrial development, was unable to supply for the support of the army. But the help thus obtained was infinitesimal in comparison with the needs, and the government had to fall back upon the sacrifices of devoted men and women. "The Southerners' sacrifices," says Dr. Schwab, "far exceeded those of the Revolutionary patriots. The Southern cause evoked as much devoted loyalty as has been called forth by any cause in history; and that cause was supported at a cost greater than in any similar conflict." Yet, in 1865, after four years of terrible struggles, it was seen that the Confederacy was tottering to its fall. It is generally held that the most potent factor in its ruin was the effective blockade of its ports, cutting it off from the only markets in which its products were available. Doubtless this is true. The Confederacy, with a debt of $1,400,000,000, was now hopelessly bankrupt. But it must also be remembered that the crop of men was beginning to fail. While the North was able to increase its active army each year, and even draw from its foreign population 720,000 men, the South in 1865 was reduced to the desperate resource of passing a law to draft the slaves into military service. "The total military population of the South," says Woodrow Wilson, "was 1,065,000, of which 900,000 went into the army for at least three years' service. The losses were about 300,000. At the end, 175,000 surrendered to armies of 980,000." It is idle, therefore, to attribute the downfall to the errors of the President and his Cabinet or the deficiencies of the Constitution. In accumulated wealth, in industrial development, in ships and in men, the South, in a prolonged struggle, was no match for its powerful adversary. The logic of facts pointed to a united country. See CONFEDERATE STATES OF AMERICA; UNITED STATES — CAUSES OF THE CIVIL WAR.

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35. THE POLITICAL EVENTS OF THE CIVIL WAR. The Civil War in America began by the Confederate attack on Fort Sumter, 12 April 1861. The secession movement had begun upon Lincoln's election; war

had become inevitable at the time of his inauguration. Two authorities — two sovereignties — were claiming independent jurisdiction over the same area, and, after that, it was only a question of time when these would meet in armed conflict. All effort at further compromise had failed. The time for saving the Union by conciliation and concession had passed. The United States government had now to decide either to recognize the Southern Confederacy as an independent power in its own limits, or to vindicate the national authority by force of arms. There was no longer any middle ground.

The issue upon which Lincoln had been elected was the restriction of slavery to the area of the slave States. The first purpose of the new President upon coming into power was to restrict the area not of slavery but of secession. There were still thousands of Union men, especially in the border States and among Mr Lincoln's party opponents in the North, to whom "coercion? was odious; who thought that military force as a means of holding the States together was not only useless but pernicious; who believed, or professed to believe, that the national authority could never be successfully asserted by the bayonet and the sword against such a formidable revolution as that represented by the confederated slave States; that compromise and conciliation were still the only hope of holding the border States; that the Union, now destroyed because of abolition fanaticism and folly, could be restored only by dividing public opinion in the South, and by waiting until Southern men could be induced to accept Federal appointments and until the civil machinery of the Federal government could again be put in motion in the Southern States. Lincoln recognized this body of conservative Union opinion, and whatever of genuine loyalty to the national cause there was in it he wished not to antagonize. He would bring every possible man, every ounce of opinion, to oppose secession. He would, if possible, unite the North, divide the South and save the border States. For this reason Mr. Lincoln's inaugural address was quite conciliatory in its attitude toward slavery and the South. The platform of his party committed him both to "the preservation of the Union and the maintenance of the right of each State to order and control its own domestic institutions according to its own judgment exclusively." In his inaugural address Lincoln reiterated this sentiment of his party platform, and, quoting one of his former speeches, he declared, "I have no purpose, directly or indirectly, to interfere with the institution of slavery in the States where it exists. I believe I have no lawful right to do so, and I have no inclination to do so."

In this address Lincoln took no positive anti-slavery stand. He spoke in favor of the return of the fugitive slave, and he in no way urged the cause — the non-extension of slavery — for which he had been elected. In this Lincoln merely recognized, as any statesman should have done, that the paramount issue confronting the nation had changed since his election in November. Then it had been the extension of slavery; now it was the preservation of the Union, the unity and integrity of the nation itself. Therefore, on 4 March 1861, Lincoln stood ready, for the sake of avoiding war and disunion, to subordinate, so far as it was morally possible, his own and his party's anti-slavery purposes. He would not surrender the principle for which he had been called into power and his party into being. But he declared his willingness to accept an irrevocable amendment to the Constitution prohibiting the national government from ever interfering with slavery in the slave States; and he assured the people of the South that they would not be assailed, and that they could have no conflict unless they themselves became the aggressors. But the President declared that, despite the ordinances of secession, he regarded the Union as unbroken, and that, as the Constitution and his oath of office bound him to do, he would faithfully "execute the laws of the Union in all the States"; and this he would continue to do unless, and until, his "rightful masters, the American people, shall withhold the requisite means or in some authoritative manner direct the contrary." "The power confided to me," he said, "will be used to hold, occupy and possess the property and places belonging to the government, and to collect the duties and imposts; but beyond what may be necessary for these objects, there will be no invasion, no using of force against or among the people anywhere."

Here was clearly drawn the political issue of the Civil War — national unity and the enforcement of the national authority against disunion and the right of secession. It was not possible for the national authority to recognize this issue — its own right to exist — as within the field of negotiation, and the attempt of the Confederate government to secure recognition by opening diplomatic relations at Washington was repelled.

If the national government intended to maintain its authority and to "execute the law in all the States," there was nothing for the South to do but to yield or fight. The South's answer was the defiant attack on the national authority at Sumter. The call for 75,000 three-months' volunteers and the uprising of the national spirit followed. Party issues were forgotten, and the great body of the Democratic voters in the North, following their leader, Mr. Douglas, rallied patriotically to the support of the government, as did also many Breckenridge Democrats. (See DOUGLAS; BRECKENRIDGE, J. C.). In the proclamation calling for volunteers Lincoln commanded the insurgents to disperse within 20 days, called Congress into extraordinary session for 4 July 1861, and announced that the object of the military force was to repossess the forts and places seized from the Union. The time limit of three months for the troops was made necessary by the Act of 1795, as this law authorized the use of the militia "until the expiration of three months after the commencement of the then next session of Congress."

Virginia's secession followed immediately (17 April) upon Lincoln's call for troops, upon the plea of resisting "coercion" and "invasion." Tennessee and Arkansas soon afterward followed Virginia and joined the Confederacy, but the attempt to carry Missouri and Kentucky into the secession movement was foiled by the co-operation of the national government with the Union forces in those States. After the bombardment of Sumter and before the meeting

of Congress (12 April–4 July 1861), President Lincoln assumed extraordinary war powers. (See UNITED STATES — THE PRESIDENT'S OFFICE). He proclaimed a blockade of Confederate ports (19 and 27 April); he increased the forces of the regular army and navy (3 May) by his mere executive order, and he authorized his military subordinates in several places to suspend the writ of habeas corpus. (See HABEAS CORPUS). The orders of blockade had been evoked by the purpose of the Confederate government, indicated by Mr. Davis' letters of marque and reprisal (17 April), to use its ports for fitting out privateers to prey upon the commerce of the United States. The other measures of the President were held to be justified by the emergency. (See PRIVATEERING; BLOCKADE; BELLIGERENT). Upon the assembling of Congress these executive acts were approved, and, as far as endorsement and Congressional resolution could do so, they were legalized; and Congress proceeded to make military and financial provision for a vigorous conduct of the war.

Slavery had been the primary cause of secession and war. But slavery was not the issue on which the men of either side were called upon to fight. The cause for which the North rallied to arms was union and nationality; the cause of the South was independence and the rights of the States. Both disclaimed slavery as the cause of arms. But slavery, as it was the everlasting cause of strife before the war, was the chief cause of political difference during the war; and the relation of the war to slavery is the most important point of view from which the political events of the war are to be studied. To what extent should the war be distinctly an anti-slavery war and be made an instrument of emancipation? To what extent should the war be conducted solely to preserve the Union, and to restore national authority without disturbing in any way the "domestic institutions" of the States? On these questions Mr. Lincoln was constantly subject to pressure in opposite directions. The conservatism in his nature and the conservative wing of his party required that he should not assume a more radical and aggressive anti-slavery attitude than the public sentiment of the country would support; while his party opponents were vigilant and quick to denounce and oppose him for converting and degrading the war from a noble effort for the Union into a mere abolition war for the "nigger." On the other hand the radical anti-slavery forces were constantly urging him to strike at the real strength of the rebellion by striking at its cause. This wing of the Union forces held with Sumner that the "rebellion was but slavery in arms."

Congress attempted to define the purpose of the war and its relation to slavery in the famous Crittenden Resolution of 22 July 1861, which was passed in both Houses by an almost unanimous vote. It was declared that the war was forced upon the country by the disunionists of the South; that "the War is not waged upon our part for any purpose of conquest or subjugation, nor for the purpose of overthrowing or interfering with the rights or established institutions of those States; but to defend and maintain the supremacy of the Constitution and to preserve the Union with all the dignity, equality, and rights of the several States unimpaired; that as soon as these objects are accomplished the War ought to cease." See CRITTENDEN COMPROMISE.

This is the platform upon which the conservative Democracy of the North insisted that the war should be conducted, and for any departure from this policy they were ready to denounce the administration and displace it from power. In saving the Union by war the administration must not be allowed to violate the Constitution in any way nor in any way interfere with the rights of the States or the legal status of the slaves. The political and party struggles of the Civil War focus themselves largely about this issue. On the one side were those of a conservative, purely Union-saving purpose, who were disposed to demand that the war be conducted strictly according to the forms and canons of the Constitution. Among these were probably many who cared more to save slavery and the rights of the States than to save the Union. On the other hand were the radical anti-slavery men who were determined that, while the war should be for the Union, it should not cease until emancipation should be secured. Among these were many who cared more to destroy slavery than to save the Union. Lincoln, as we shall see, occupied middle ground between these opposing extremes.

In the gradual but constant progress of the administration toward an anti-slavery policy — in its movements from an attempt to save slavery and the Union together to the policy of emancipation and the reconstruction of a new Union wholly free, there are certain notable features and landmarks. Among these we may notice, first, the attitude of the administration toward military emancipation.

As early as 25 May 1861, Gen. Benjamin F. Butler, in command of the Union forces about Fortress Monroe, gave the first indication of a military method of emancipation. He refused to return to their masters slaves coming within his lines, on the ground that they had been used in aid of the rebellion, in the erection of batteries and other works; that if slaves were property, as the South had always contended, they were, therefore, properly "contraband of war"; that this slave property, useful for military purposes, might as well be used in aid of the United States as against it; that masters in arms against the Constitution were barred from claiming the enforcement of their constitutional rights by their belligerent opponents, and that only slaves of loyal owners should be returned. Butler put this "contraband property" to work for his own military purposes. Public sentiment of the North applauded Butler's course although he was not promptly and heartily sustained by the administration.

The Confiscation Act (6 Aug. 1861), passed within a fortnight of the Crittenden Resolution, indicated the beginning of a change of policy toward slavery on the part of Congress. This is to be regarded as a military measure. It pronounced forfeiture of all slave property used in aid of insurrection and thus it substantially, under another form, endorsed Butler's contraband order. Mr. Lincoln was not pleased with the Confiscation Act, as he feared it would alienate the border States which he was diligently trying to conciliate. He wished Congress not to meddle with the slavery question,

but to leave that problem to the military authorities. On 8 Aug. 1861, two days after the passage of the Confiscation Act, Mr. Lincoln's Secretary of War, Mr. Cameron, wrote to Butler, who was pressing for further instructions: "It is the desire of the President that all existing rights in all the States be fully respected and maintained; in cases of fugitives from the loyal slave States the enforcement of the Fugitive Slave Law by the ordinary forms of judicial proceedings must be respected by the military authorities; in the disloyal States the Confiscation Act of Congress must be your guide." The slave rights of loyal masters in disloyal States were to be safeguarded as far as possible. This policy indicates Lincoln's conservatism at the beginning of the war, and his regard for vested rights whenever the slavery question appeared. In pursuance of this line of policy Lincoln tacitly endorsed Halleck's order returning fugitives and protecting slave property, while he did not hesitate to overrule and set aside General Frémont's order (30 Aug. 1861) in Missouri emancipating the slaves of all persons who had taken up arms against the United States. On 11 Sept. 1861 Lincoln overruled Frémont and on 19 May 1862 he revoked and repudiated a similar order of General Hunter for the Department of the South. Lincoln declared that "no commanding officer shall do such a thing upon my responsibility without consulting me." Chase and other anti-slavery supporters of the administration urged Lincoln to let Hunter's order stand, but the President was afraid it might alienate support from his policy of compensated emancipation which he was then urgently pressing upon the representatives from the border States. In his annual message of December 1861, Lincoln had expressed his purpose still "to keep the integrity of the Union prominent as the primary object of the contest." By this time Congress, aroused by the sad losses of the war and the formidable power of the rebellion, refused to reaffirm the Crittenden resolution of the previous July. This refusal seemed to indicate that other objects of the war were in view besides the suppression of the insurrection.

By the spring of 1862 Lincoln's policy on slavery may be said to involve gradual emancipation by the consent and co-operation of slave-holding States; national aid for the compensation to owners, and the colonization of the negroes made free by this policy and by the operation of the Confiscation Act of Congress. Up to the time of the rejection by the border slave States of Lincoln's policy of compensated emancipation and its failure in consequence, anti-clavery sentiment and purpose may be said to have been more radical and outspoken in Congress and the country than in administration councils. But after he dismissed his plan of compensated emancipation Lincoln determined upon emancipation in another way. This was emancipation as a war measure, by military power. He made known this purpose to his Cabinet as early as 22 July 1862. It was determined in the Cabinet council not to make public announcement of this policy until a more favorable military situation could be secured. Lincoln's pro-slavery orders, and his policy that seemed so much like timid conservatism, led the radical Republicans and anti-slavery men to continue their pressure and hostile criticism. The effort to induce Lincoln to take a more decided stand against slavery brought out the celebrated Greeley-Lincoln correspondence. Greeley sent to Lincoln and published in his *Tribune* (20 Aug. 1862) his "Prayer of Twenty Millions." This letter created a distinct impression upon the country and is a document of historical importance. "All who supported your election," said Greeley, "and desire the suppression of the rebellion are sorely disappointed by the policy you seem to be pursuing with regard to the slaves of rebels." The editor urged Lincoln to execute the laws, especiallv the Confiscation Act, and he censured the President as disastrously remiss with regard to the emancipation provision of that act. "You are unduly influenced by the counsels, the representations, the menaces of certain fossil politicians hailing from the border slave States; timid counsels in such a crisis are calculated to prove perilous and probably disastrous. We complain that the Union has suffered, and is now suffering, immensely from your mistaken deference to rebel slavery."

Lincoln's famous reply to Greeley contains in the most succinct form a statement of his war policy and his political attitude toward slavery. "I would save the Union." This Lincoln announced as his constant end and aim.

> If there be those who would not save the Union unless they could at the same time save slavery, I do not agree with them. If there be those who would not save the Union unless they could at the same time destroy slavery, I do not agree with them. My paramount object in this struggle is to save the Union, and is not either to save or to destroy slavery. If I could save the Union without freeing any slave, I would do it, and if I could save it by freeing all the slaves, I would do it; and if I could save it by freeing some and leaving others alone, I would also do that. What I do about slaves and the colored race, I do because I believe it helps to save the Union; and what I forbear, I forbear because I do not believe it would help to save the Union. I shall do less whenever I shall believe what I am doing hurts the cause, and I shall do more whenever I shall believe doing more will help the cause. I shall try to correct errors when shown to be errors, and I shall adopt new views so fast as they shall appear to be true views. Such is my purpose according to my view of official duty. I intend no modification of my oft-repeated personal wish that all men everywhere might be free.

In September 1862 Lincoln publicly announced his policy of emancipation. (See EMANCIPATION). Notwithstanding this forward step, momentous in its ultimate, if not in its immediate, results, dissatisfaction with Lincoln among anti-slavery men continued and a concerted movement arose within the Republican party to supersede Lincoln in the leadership. The dissatisfied Republicans sought to secure the nomination of Chase or some other more radical anti-slavery man for the Presidency. When this fell through, the more radical spirits secured an independent convention and the nomination of Frémont against Lincoln in 1864, and this indicated a serious division within the Union-Republican party. On the other hand conservative men in the administration, like the Blairs, and others sincerely in favor of the war for the Union, opposed the Emancipation Proclamation on the ground that it would lose the fall elections, alienate support from the war and endanger its success; while the Democratic opposition in the North were seizing upon all the anti-slavery measures of Congress and the President as material for a political campaign against the administration, on the ground that the war for the Union was being turned into a war for abolition.

The anti-slavery purposes of the war were making headway. The Democratic opposition to the war policy of Mr. Lincoln arraigned the administration on various indictments. The refusal of Congress to reaffirm the Crittenden Resolution; the abolition of slavery in the District of Columbia (April 1862); the abolition of slavery in the Territories (June 1862); the second Confiscation Act of 17 July 1862, providing for the emancipation of the slaves of rebels and their abettors, and for the employment of such freedmen in the suppression of the rebellion as the President might direct; the military annulment of the Fugitive Slave Act by the contraband policy and by the act (13 March 1862) forbidding military officers from arresting and returning fugitive slaves; the scheme for compensated emancipation, because of its enormous expense; the emancipation proclamation, as tending to incite slave insurrection; the military organization of the blacks (July 1862), as tending to equalize the white soldiery with the negro; the recognition of Liberia and Haiti; the enlargement of legal privileges for the negroes where they were under national jurisdiction — all these measures were denounced by the opponents of the administration and were used to prove the abolition and unconstitutional character of the war.

On account of these anti-slavery measures all those were arrayed in the political opposition whose race prejudices against the negro were pronounced; who hated the New England abolitionists as much, or more, than they did the "fire-eating" secessionists; who believed in slavery, or were indifferent to its evils; who thought that in the conduct of the war the wrongs of the negro should not be taken into account and that the interests of the white race alone should be considered.

Another noticeable factor in this opposition were the constitutional legalists, who were insistent upon holding the conduct of the war strictly to the forms of the law and the Constitution. These made the preservation of civil liberty and the rights of the individual their special cause and chief concern. They were more strenuous to preserve these individual rights than they were to preserve the Union, and they contended that the Union could not be preserved, or need not be, if the Constitution and the law were violated and disregarded. That which claimed their obedience and loyalty, they asserted, was not a person invested with office, nor an idea of public necessity, nor an imaginary national life apart from the life of the Constitution. "What the Constitution ordains or authorizes, *that* is the public necessity, *that* is the national life, *that* is the supreme civil obligation." This was the position taken by able and conservative lawyers and leaders like George Ticknor Curtis and Horatio Seymour, who opposed the conduct of the war because of what they considered the high-handed usurpations of power by the war authorities. They felt that loyalty required them to be loyal to the reserved rights of the States as the supreme law of the land as well as to the powers vested in the general government; that loyalty bound them to safeguard the rights of persons and property guaranteed by the Constitution to every citizen, as well as to support a war to crush insurrection. With these feelings and principles they opposed the administration on account of the suspension of the writ of habeas corpus, on account of arbitrary arrests and the suspension of free assembly, free speech and free press. Certain newspapers had been suppressed (the New York *News*, the New York *Journal of Commerce*, Chicago *Times* Brooklyn *Eagle* and others) on the ground that they were encouraging the rebels to persevere in their resistance, by expressing sympathy with them, by urging the duty of acceding to their demands and by expressing dissatisfaction with the policy of employing force to overcome them. These papers were constantly denouncing as "an unholy war" the war "in defence of our country, its institutions and most sacred rights, and carried on solely for the restoration of the authority of the government." This kind of party opposition to the war was what Lincoln called "the fire in the rear." See HABEAS CORPUS; MILLIGAN DECISION.

Some of these opponents of the war were disloyal factionists who at heart were in sympathy with the South, and who preferred disunion to the political and military success of the administration. These were the "Copperheads" of the North. Clement L. Vallandigham of Ohio was one of the most distinguished and extreme representatives of this group. He was arrested at Mount Vernon, Ohio, in May 1863, upon a charge of "publicly expressing sympathy for those in arms against the government of the United States and declaring disloyal sentiments and opinions with the object and purpose of weakening the powers of the government in its efforts to suppress an unlawful rebellion." He was found guilty by a military tribunal and sentenced to close confinement — a sentence which President Lincoln commuted to banishment to the enemy's lines. The Democrats of Ohio officially protested against these proceedings and Lincoln informed them that Vallandigham had been arrested because "he was laboring with some effect to prevent the raising of troops, to encourage desertions from the army, and to leave the rebellion without any adequate military force to suppress it." While in exile Vallandigham was nominated by the Democrats for the governorship of Ohio and was defeated by the unprecedented majority of 100,000 votes.

Elsewhere in the North Democratic leadership, while its purposes and principles were in most respects the same as those of Vallandigham, was more moderate and restrained, and, under the direction of men whose loyalty to the Union was undoubted, the Democratic successes in the elections of 1862 and 1863 were very pronounced. The military losses and disasters, the newness of the emancipation policy, the unexpected extension of the war, the unfriendly attitude of foreign powers, the growing belief that the Union could not be restored by war, the vigor of the Democratic attack in the rear — all these were factors in causing the loss of the fall elections in 1862. This was interpreted as a vote of want of confidence in the administration, and it is probable that if Lincoln had been a candidate for re-election in 1862 he would have been defeated.

Another cause of opposition is to be taken into account after the summer of 1863. This was the Conscription Act and the effect of the draft. Although what seems now like decisive military successes had come to the national arms in July of that year (Gettysburg, Vicks-

burg) a successful end of the war seemed distant, and the people were becoming very weary of waste, bloodshed and battle. They were sighing for peace. But the burdens of the war were to be still further increased. On 3 March 1863 Congress passed a Conscription Act authorizing a draft of 300,000 men. Certain provisions of the act led to disagreements as to quotas between Federal and State authorities, and a clash seemed imminent. A $300 clause allowed a man who could pay that sum to be released, while one who could not must go into the ranks. With this discrimination in favor of the rich and against the poor, a great deal of popular prejudice and opposition were aroused by the party opponents of the administration against the draft; and the draft riots in New York, in July 1863, resulted in serious loss of life and property. Governor Seymour of New York requested President Lincoln to suspend the enforcement of the draft in that State, and it was intimated to Secretary Stanton that this act could be enforced only by the co-operation and consent of the State authorities. Stanton held that the issue of the Civil War was the enforcement of the national authority by its own power without dependence upon the consent of the State.

Added to the excitement and opposition aroused by the draft came the President's proclamation of 15 Sept. 1863, suspending the privilege of the writ of habeas corpus throughout the United States in all cases where persons were held by the civil, military or naval authorities under the orders of the President, as «aiders or abettors of the enemy.» This proclamation followed the grant of power conferred by the Act of 3 March 1863, by which Congress, as it had previously legalized previous suspensions of the writ, authorized the President to suspend this guarantee of personal liberty during a period of Civil War throughout the whole United States. Under this act military arrests without civil warrants and trials by military commissions continued in various parts of the North. The critics of the administration held that the purpose of this policy was to consider all political opponents of the administration as «aiders and abettors of the enemy,» and they feared that all political discussion and criticism were to be suppressed by a military absolutism. (See HABEAS CORPUS; MILLIGAN DECISION). Freedom of the mails had also been denied to hostile matter, or such as might instigate others to co-operate with the enemy. (Consult Report of the Judiciary Committee of the House, 20 Jan. 1863).

Thus, with divisions within the ranks of the Union-Republican party, with the country longing for peace, with many factors and elements arousing and uniting the opposition, there was danger that the Union-Republican party would be defeated by the party calling itself the «Conservative-Union Party.» This party had nominated Gen. George B. McClellan, one of Lincoln's deposed generals, on a peace platform, demanding peace after «four years of failure to restore the Union by war.» Their policy was to restore the Union by stopping the war, by armistice, negotiation, convention,— by some diplomatic agreement to which both parties might agree, and that fighting should cease until an arrangement could be adjusted. They would substitute negotiation for subjugation. Presumably, in the mind of this party, if negotiation failed disunion was preferable to a continuance of the war. Their great political error was in their failure to perceive that it was forever too late, on account of the state of public sentiment both North and South, to secure a restoration of the old Union under the old Constitution. While there was any hope left to them in the field the South would never consent to a restoration of the Union; and when their military defeat, after Atlanta, Nashville and Sherman's march to the sea, became a foregone conclusion, then the terms of settlement and reunion were to be determined only by the national will. But it was in the face of the situation before these military victories in the latter part of '63 and the early part of '64, with the cry for peace seemingly almost irresistible, that Andrew, Sumner and other radical anti-slavery men felt that the most important thing to do was to rescue Lincoln from the peace influences that seemed to surround him; from those who were tempting or pushing him to an unworthy or disgraceful offer of compromise with the leaders of the rebellion. These radical spirits wished to prevent Lincoln from offering the South peace merely on the basis of a restored Union without emancipation.

There were other political phases of the war on which the opposition joined issue with the administration. The conduct of foreign affairs was made the subject of severe animadversion. In the settlement of the *Trent* affair it was charged that Seward had been subservient to Great Britain and had sacrificed the national honor. In his tolerance of the French intervention in Mexico he had sacrificed the traditional policy of the Monroe Doctrine (q.v.). In domestic affairs the financial and revenue policy of the government were brought into adverse review; while the creation and the admission of West Virginia were denounced as an unconstitutional act of spoliation and dismemberment of the «Old Dominion.»

In the long session of 1861–62 Congress passed a number of measures which, even in this brief review, should not go unmentioned. It authorized the President to take possession of the railroad and the telegraph when the public safety required it; passed a Homestead Act; established a Department of Agriculture; passed the act to donate public lands to States and Territories for the purpose of founding agricultural colleges; authorized the construction of a railroad to the Pacific Ocean, aiding the road in land and government bonds; and, finally, created the comprehensive scheme of internal taxation. The famous Revenue Act of 1 July 1862 developed the excise tax in a manner unheard of in this country before. Writers have frequently applied to this system of internal revenue Sydney Smith's humorous account of British taxation in 1820: «Taxes upon every article which enters into the mouth, or covers the back, or is placed under the foot; taxes upon everything which it is pleasant to see, hear, feel, taste or smell; taxes upon warmth, light and locomotion; taxes on everything on earth and the waters under the earth.» Every visible commodity or transaction was taxed. Licenses were required of all distillers and brewers, manufacturers, wholesale and retail dealers, of men in all kinds of business,— proprietors of theatres, of jugglers and circuses,

of lawyers, physicians, surgeons and dentists. The act imposed 20 cents per gallon on spirits, $1 per gallon on malt liquors, a heavy tax on tobacco and cigars, carriages, yachts, billiard tables and plate; on slaughtered hogs, cattle and sheep; on passports, legacies and receipts from railroads, steamboats and toll-bridges; on dividends from banks and trust companies; and 3 per cent was assessed on incomes less than $10,000 and 5 per cent on incomes over $10,000, with an exemption of $600. Stamp duties on all kinds of paper were imposed. The income tax was regarded as a form of excise, not a direct tax. (See INCOME TAX). This Revenue Act and Legal Tender Acts under which $450,000,000 of legal tender notes, commonly called greenbacks, were issued, were the most important pieces of fiscal legislation during the war. See LEGAL TENDER.

After the military successes of the Union arms in the fall of 1864 and after the re-election of Lincoln all hope of an independent Confederacy passed away. It was then only a question of endurance, of "fighting to the last ditch." The peace conferences had come to naught and the demands for an armistice were no longer a menace to the complete triumph of the national arms. (See HAMPTON ROADS CONFERENCE). Already, in 1864, the 13th Amendment and the various plans of reconstruction had begun to receive the attention of Congress, and it is to these subjects, after the fall of 1864, that the student of the political history of the war should give his attention.

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36. FINANCES (1861–1919). In the winter of 1860–61 the finances of the Federal government were most discouraging. Secession was under way; national credit depressed, and executive efficiency was slowly disintegrating. There was little confidence that the Republican party, which had carried the election in November 1860, would be able to weather the approaching storm. Some strength was shown at the close of the session by the passage of a new tariff law known as the Morrill Tariff, in which rates were slightly advanced. Lincoln took office 4 March 1861 and appointed Salmon P. Chase Secretary of the Treasury. On 15 April the troops were called out to put down the Rebellion and the country entered upon a four years' war which tried the financial system to the utmost, necessitated radical methods of financiering, burdened the country with an enormous debt and raised taxes to a permanently high level. In brief, during the fiscal years 1862–65, expenditures were $3,348,000,000; taxes $667,000,000 and loans $2,622,000,000. Loans were nearly four times as large as taxes. In the spring of 1861 it was not supposed that the war would last long and consequently the legislation of July and August was not designed to increase taxes in any considerable degree. A loan of $250,000,000 was authorized, some increase was made in the tariff schedules and an income tax was levied. Under the authority of the Loan Act the Treasury Department endeavored with the assistance of local banks to borrow $150,000,000 by the issue of three-year treasury notes, bearing 7.3 per cent interest, since known as the seven-thirties. The banks responded with energy, but owing to the restrictions of the independent Treasury Law requiring all payments to the government to be made in specie, they could not carry the burden and in December suspended specie payments. The Treasury Department was forced to follow their example. By the Act of 25 Feb. 1862, a comprehensive loan act was passed and authority given for the issue of $150,000,000 non-interest legal tender treasury notes. There was much opposition to making the notes legal tender, but the issue was justified in the debates on the ground of necessity—"necessity to meet the immediate obligations of the government; necessity to give currency to treasury notes; necessity to provide money which would in turn purchase bonds." Two further issues, each of $150,000,000, were made by the Acts of 11 July 1862 and 17 Jan. 1863. In addition to these non-interest notes, the legal tender quality was attached to some of the other short-term treasury notes. Other forms of treasury indebtedness were demand notes, certificates of indebtedness, temporary loans and fractional currency. Of the total amount borrowed $1,045,000,000 was in the form of long-term loans; $890,000,000 in interest-bearing notes; $458,000,000 in non-interest bearing notes and $208,000,000 in temporary loans.

In selling long-term bonds Chase kept four objects in view: (1) moderate interest; (2) general distribution; (3) future controllability, and (4) incidental utility. Chase objected to selling bonds at a discount, or to offering more than 6 per cent interest. After the suspension of specie payments the legal treasury tender notes, or greenbacks, depreciated greatly in value; as they were, however, receivable in the purchase of bonds and as the bonds bore interest in gold, the return to the purchasers, as measured in gold, was far greater than the nominal rate of interest would indicate. Under the con-

ditions, therefore, the market for bonds constantly broadened. To secure a wider distribution in the investment of government securities, an agent, Jay Cooke (q.v.), was employed with an extensive system of sub-agents to place the bonds in every section of the country. Chase was also opposed to making long loans and consequently reserved the right to the government of redeeming bonds after 5 or 10 years. This gave rise to securities known as 5-20's and 10–40's, running for 20 or 40 years, but redeemable at the option of the government at the shorter period. In order to make a wider market for bonds, as well as to reform the currency system on a national basis, the national banking system was organized in which circulation is based upon the deposit of bonds.

In July 1862 a more vigorous policy of taxation was adopted; internal revenue taxes were imposed upon fermented liquors and tobacco; upon occupations, auction sales, carriages, yachts, billiard tables and plate; upon slaughtered cattle, transportation agencies, banking and insurance companies, advertising, incomes, and legacies. At the same time tariff duties were increased to compensate domestic industry for the internal revenue duties. Internal revenue receipts did not meet expectations and in 1864 a second expansion of the revenue policy was made. The internal revenue system was well-nigh universal in its application. "Nothing was omitted from the raw product to the finished commodity; often an article received a half dozen additions ere it reached the consumer. And not only were all the constituent elements which entered into an article taxed, as the bolts, rivets, castings, trimmings and the like of an engine, but the engine when completed was subjected to an additional ad valorem duty upon its value." Customs duties were again advanced because of the increased duties upon manufactures. The Act of 1864, however, went further in the direction of protection and brought rates up to a level which established a new standard of protectionism. The average rate on dutiable articles was increased to 47 per cent. The income tax of the war period was highly productive; at its maximum, incomes between $600 and $5,000 were taxed 5 per cent; and incomes above $5,000, 10 per cent. The total receipts from this source, 1863–73, amounted to $347,000,000.

When the legal tender notes were first issued they were convertible into bonds — securities which had a definite gold value, as interest was payable in gold. The quality of convertibility was taken away by the Act of 3 March 1863 and this, together with the increased issues and the waning hope that the government would be able within any short period of time to settle its obligations on a gold basis, led to a marked depreciation in the value of greenbacks. In July and August 1864, the average value of the gold dollar in currency was but 39 cents. As gold was daily needed by importers to pay customs duties and to settle balances abroad, a brisk and often speculative market in bullion resulted. Moreover, the repeated fluctuations in the value of gold measured in currency, occasioned by alternating hopes and fears as to the outcome of the war, affected all business. Prices were abnormally high and it was estimated that the cost of the war to the treasury alone was increased by the inflated issues about $600,000,000.

When peace was restored in 1865, there were three enormous tasks before the government: funding the debt into more convenient form, revision of the tariff system and the restoration of a standard of value by the resumption of specie payment. On 1 Sept. 1865, the public debt was $2,846,000,000; less than one-half of this was funded; loans bore interest at five different rates; they matured at 19 different periods, and some were convertible or redeemable at the option of the government. At first there was apparently general agreement that the volume of legal tender notes should be reduced, for on 18 Dec. 1865 the House of Representatives passed a resolution in favor of a contraction of the currency with a view to as early a resumption of specie payments as the various interests of the country would permit. The Funding Act of 12 April 1866 authorized the conversion of temporary short-time interest-bearing securities into long-term bonds, but provided only a slight contraction of legal-tender notes. It gave authority to retire $10,000,000 within six months and not more than $4,000,000 in any one month thereafter. Even this reduction was not long continued. It was not easy for the country to readjust itself to peace conditions. Discontent was especially strong in agricultural sections where indebtedness had been incurred by farmers on long-term credits. The return of hundreds of thousands of soldiers to industry led to many ill-advised ventures and failures. Prices naturally fell with the withdrawal of the excessive demands made by war, and for this fall producers were disposed to place the blame upon the contraction in currency. On 4 Feb. 1868, after $44,000,000 in greenbacks had been retired, further contraction was suspended. In 1869 the Supreme Court in the case of Hepburn v. Griswold decided, four to three, that the legal tender notes were unconstitutional. In 1871 the decision was reversed on the ground that the government had the right to employ freely every means, not prohibited, which was necessary for its promotion. In 1884 the court decided in favor of the constitutionality of issues in times of peace.

National credit was also assailed by the proposition that Federal securities should be subject to local taxation and by the demand that bonds should be redeemed in currency instead of in coin. In some sections bitter attacks were made upon the rich, who were represented as owners of idle wealth which they had gained through the possession of government securities at the expense not only of the laborer who had toiled under low wages and high prices, but also of the soldier who had taken his life in his hands and had received his pay in greenbacks. In 1870 a Refunding Act was passed authorizing the issue of $500,000,000 bonds at 5 per cent, redeemable after 10 years; $300,000,000 at 4½ per cent, redeemable after 15 years and $100,000,000 at 4 per cent, redeemable after 30 years, all to be paid in coin and exempt from national, as well as local, taxation. This act with supplementary legislation fixed the character of the debt for the next 25 years.

In 1873 a commercial panic occurred resulting in prolonged industrial depression. The treasury endeavored to relieve the situation by

reissuing $26,000,000 of legal tender notes and Congress passed a bill for a permanent increase to $400,000,000. This inflation bill was vetoed by President Grant in a notable state paper, 22 April 1874. The Republican party, then spurred on by the repeated victories of the Democrats, by Grant's firm stand and the insistence of Secretary Bristow, finally determined to make resumption effective. In the Act of 14 Jan. 1875, it was provided that resumption of specie payments should be entered upon 1 Jan. 1879, and authority was given to the Secretary of the Treasury to sell bonds in order to acquire the necessary amount of gold. In 1877 John Sherman (q.v.) was appointed Secretary of the Treasury and vigorously undertook a policy of gold accumulation; $138,000,000 in gold was regarded as sufficient to win confidence in the ability of the government to redeem all notes presented and for this Sherman sold $95,500,000 of bonds. Resumption was accomplished on the date set.

In the meantime a new financial question had arisen. In 1873 silver was demonetized by Congress; a variety of causes led to a fall in the bullion value of silver, among which were its demonetization by Germany in 1871; the limitation of coinage in the Latin Union in 1873, and the discovery of new supplies of silver in the United States. The depression following the panic of 1873 started a new clamor for an increased supply of currency and it was bitterly asserted that the United States had joined in a conspiracy to disown silver and limit the volume of legal tender money, in the interest of the creditor class. A struggle ensued to secure the free and unlimited coinage of silver, and in 1878 the Bland-Allison Act was passed over the veto of President Hayes providing for the monthly purchase of not less than $2,000,000 and not more than $4,000,000 of silver bullion at the market price. The Bland-Allison Act of 1878 continued in operation until 1890. Under its provisions 378,000,000 silver dollars were coined, at a purchase value of only $308,000,000, thus yielding a seigniorage of about $70,000,000. As the country had become accustomed to paper money, it was difficult to put the new coins in circulation; authority was consequently given for the issue of silver certificates in denominations as low as $1 for the deposit of coin. There was a more serious objection to continuing coinage in the fear that it would be impossible to maintain a gold standard. Secretary McCulloch in 1884 and Secretary Manning in 1885 endeavored to arouse Congress to a repeal of the act. The demand, however, for an enlarged currency, represented both by the greenback movement of the period and by those who advocated still freer coinage of silver, made it impossible to secure this legislation.

After the Civil War sweeping changes were made in internal revenue taxes. In 1870 there were left only those on distilled spirits, fermented liquors, tobacco, banks and bankers, adhesive stamps and certain manufactured articles and the income tax; the latter was repealed in 1872. There was less readiness to change tariff duties; protectionism had gained in strength through the growth of manufactures and the Republican party from its origin had been committed to the principle. Slight reductions were made, but the system as a whole was maintained with little change. The country recuperated from the crisis of 1873 and beginning with 1880 large surpluses were turned into the treasury. The Refunding Act of 1870 hampered the government in the redeeming of bonds, except at a premium, and in 1883 Congress was forced to overhaul the tax system. All internal revenue duties were repealed except those on spirits, fermented liquors and tobacco. Rates on tobacco were reduced one-half. A tariff commission recommended a substantial reduction in customs, but Congress paid little heed and enacted a protective tariff in which a harmonious framework was sacrificed to the pressure of conflicting interests. The Democrats repeatedly endeavored, particularly during President Cleveland's administration, 1885–89, to enact tariff measures, but protectionist sympathies within the party defeated every attempt. In 1889 the Republicans regained control and in 1890 enacted a measure, the McKinley Bill, in which protectionism was developed to a point hitherto unknown. Increased duties were laid upon a great number of articles and in some cases the rates practically prohibited importation. The act also introduced two new principles — a bounty on the domestic production of sugar and commercial reciprocity under executive proclamation.

In 1890 silver sentiment affecting both parties was so strong that further concessions had to be made in order to prevent unlimited coinage. An act was passed known as the Sherman Silver Purchase Act, providing for the purchase of 4,000,000 ounces of silver buillion monthly, and the issue in payment thereof of treasury notes of full legal tender. This increased the monthly purchases of silver and authorized treasury notes of full legal tender in place of silver certificates which were of only partial legal tender quality. Treasury notes were redeemable either in gold or silver coin at the discretion of the secretary.

Under the McKinley tariff customs duties declined, and this, coupled with commercial disturbances involving the United States, resulted in the exportation of gold. Large amounts of gold were obtained from the treasury by the presentation of legal tender notes and treasury notes of 1890. The gold reserve which since 1879 had been maintained at $100,000,000, or more, began to slip away until there was fear that the treasury would be forced on to a silver basis. On 30 June 1890 the reserve stood at $190,000,000; three years later it had fallen to $95,000,000. The significance of the underlying forces which were weakening government credit were not, however, clearly seen and appropriations continued to be made with a liberal hand. In 1890 there was a surplus of $105,000,000; in 1893 it was but $2,000,000, and in 1894 there was a deficit of $70,000,000.

The Democrats won in the election of 1892 and Cleveland again became President. In June 1893 the mints in India were closed to the coinage of silver; this led to a still further fall in the price of silver bullion and occasioned immediate apprehension that the treasury would soon be unable to redeem its obligations in gold. Within a few weeks the country was in a state of panic. President Cleveland called a special session of Congress and after most urgent pressure secured the repeal of the Silver Purchase

Act of 1890. The country did not easily recover from the panic; withdrawals of gold from the treasury continued and the administration was forced to make four issues of bonds in order to keep an adequate supply of gold on hand to meet the requirements of the "endless chain." The embarrassment of the treasury was also aggravated by an insufficient supply of revenue. The Democrats in 1894 enacted a new tariff measure which included an income tax; as introduced in the House under the leadership of Wilson, this bill was in the interest of free trade, but protective sentiment within the Democratic party radically modified the measure in the Senate, so that in its final form it made little change in existing policy. The income tax was promptly attacked on the ground of unconstitutionality. In a decision of 8 April 1895, the Supreme Court decided that a tax on income from land was a direct tax and, therefore, unconstitutional unless apportioned; and in a decision 20 May, income derived from other sources was also brought within the same interpretation.

The Presidential campaign in 1896 was fought out on the basis of free silver. The Democrats in their platform declared in favor of the free and unlimited coinage of both gold and silver at the ratio of 16 to 1 without waiting for the aid or consent of any other nation; the Republicans, on the other hand, demanded international agreement. The Republicans won and made good the victory for the gold standard in the Currency Act of 1900. This declared gold as the standard of value and authority was given the Secretary of the Treasury to maintain it by the temporary locking up of treasury notes and the sale of bonds, whenever the reserve fell below $100,000,000. The act also provided for the refunding of the debt at a lower rate of interest, and gave national banks opportunity to take out a larger amount of circulation.

Upon their return to power in 1897, the Republicans enacted the Dingley tariff; on some commodities the duties of 1890 were restored, on others compromises between the rates of 1890 and 1894 were accepted, and in a few instances the lower rates of the Wilson tariff were allowed to stand. The principle of reciprocity, dropped in the Wilson tariff, was again incorporated into the tariff system to be brought into operation, however, by treaties executed by the Senate. In 1898 war with Spain necessitated the issue of $200,000,000 of bonds and the levying of new internal revenue duties. This proved amply sufficient to meet the increased expenditures for the army and navy.

With the opening of the new century, industrial and corporate enterprise developed on an unprecedented scale. The trust movement was in full swing and large amounts of corporate securities sought investment. Crops were large, and, beginning with 1902, the autumnal money stringency repeatedly became severe. Prosperity at the same time created a series of treasury surpluses. Congress, therefore, in 1901 and 1902 repealed the internal revenue duties imposed in 1898; and Secretary Shaw endeavored through the agency of the Treasury Department to relieve the money market. He used not only the old expedients of depositing government funds in banks and of purchasing bonds, but made new rulings whereby banks could more easily secure government deposits. State, municipal and even railroad bonds were accepted from banks as collateral for deposits. The number of depositary banks increased from 442 in 1900 to 713 in 1903, and government deposits from $93,000,000 to $413,000,000.

During this period the monetary circulation gradually increased. Bank circulation grew from $254,000,00 in 1900 to $739,000,000 in 1911. But the currency system remained as inelastic as ever, and the increased circulation brought with it the dangers of inflation. In October 1907, a severe panic occurred which brought the problem of currency reform into greater prominence. Many plans were proposed, as for establishing a central bank, legalizing notes issued by clearing-house associations and for the issue of an emergency circulation. The result was the Vreeland-Aldrich Act of 1908, which provides for the issue of supplementary credit notes subject to a special tax. Provision was also made for the appointment of a monetary commission to devise a more permanent and satisfactory plan. This commission in 1912 reported in favor of the establishment of a reserve association chartered by the Federal goverment to be the fiscal agent of the government and to hold its deposits. Its banking powers were limited to dealings with banking institutions, and ultimately the plan provided for giving to the reserve association the sole power of note issue. Much fear, however, was expressed that this would centralize the banking power and thus establish under another name a central bank, to which public opinion was generally opposed. Action was consequently delayed.

In 1910 Congress authorized the establishment of a postal savings bank system, whereby a certain percentage of the deposits are kept as a reserve fund in the treasury and a part invested in government securities.

In 1909 the Payne-Aldrich Tariff Act was enacted. Although there was general expectation that duties would be lowered, but few important changes were made. The most important change was the placing of hides on the free list. Reciprocity as a general principle was abandoned and a policy of retaliation endorsed through the adoption of a maximum and minimum principle. There was much disappointment over the outcome of this tariff struggle, for the cost of living was increasing and monopolistic influences appeared to be more and more oppressive. The Democrats secured a majority in the House of Representatives in 1910, and passed several tariff bills for the reduction of rates, particularly on cotton and woolens. These bills, however, were vetoed by President Taft. In January 1911, President Taft arranged a reciprocity treaty with Canada which provided for free trade in certain food products and reduced duties on manufactured goods. Only after a struggle was this agreement endorsed by Congress. Canada, however, decided against it.

Authority was also given for the appointment of a tariff board which should collect data to assist the President in determining when a foreign country was entitled to the minimum scale of duties. Later this board was given

larger powers in the collection of information which it was hoped might be of service in framing new tariff laws. The board employed experts and published exhaustive reports on the cost of production of woolen and cotton goods. The Democrats, however, were disinclined to accept the assistance of this new branch of administrative machinery on the ground that it encroached upon the legislative privilege and duty of originating and framing tariff bills. In 1912 consequently the board went out of existence owing to lack of an appropriation for its support.

The Payne-Aldrich Tariff Act provided for a tax of 1 per cent on incomes above $5,000 of all corporations organized for profit. Congress also proposed a constitutional amendment whereby a general income tax might be imposed, and this was accepted by two-thirds of the States.

The growth of treasury receipts and expenditures since the Civil War until 1910 is shown in the following table (in millions of dollars):

GROWTH OF TREASURY RECEIPTS AND EXPENSES.

	Customs	Internal revenue	Total receipts	Expenditures
1870	195	185	396	294
1880	187	124	334	265
1890	230	143	403	298
1900	233	295	567	488
1910	334	290	676	651

Expenditures rapidly increased after the Spanish War. The colonial possessions imposed new burdens of protection and development upon the government; and there was a growing consciousness that this country must be in a position to take a larger place in world politics. The army, and more particularly the navy, made heavy draughts upon the treasury. The cost of the navy increased from $56,000,000 in 1900 to $123,000,000 in 1910. The government extended its activity in many new directions at home. Of special importance were the expenditures for the Department of Agriculture. Between 1900 and 1912 the sum appropriated for agricultural purposes was $90,000,000, or double the sum expended in the previous 60 years. New services were undertaken, as food and meat inspection, the reclamation of arid land and the extension of the forest service. Salaries increased with the growing cost of living; new public buildings were constructed, and the Census Bureau was made permanent. The cost of construction of the Panama Canal, amounting to nearly $300,000,000, was in part paid out of current taxation and in part by loans.

The Democrats came into power in 1913. Their first step was to enact a new tariff law, known as the Underwood tariff. Ad valorem rates were substituted for specific and compound duties; the free list was extended, including coal, leather, wood-pulp, lumber, agricultural implements and machinery, wood, and ultimately sugar. Rates on many manufactured products were lowered and simplified. It is difficult to determine the effect of this new tariff either upon industry or fiscal receipts owing to the outbreak of the Great War in 1914 which disturbed so violently the normal commercial relationships of this country with Europe. Customs receipts fell from $319,000,000 in the fiscal year ending June 1913 to $210,000,000 in 1915 and $183,000,000 in 1918. The latter figure is the lowest reached for 20 years. The average ad valorem rate of duty on the total volume of dutiable goods has fallen from 50 per cent in 1899 to about 25 per cent; and on all goods, dutiable and free, from about 30 to less than 8 per cent.

The new Democratic Congress took advantage of the recent constitutional amendment authorizing the levying of an income tax, by including in the Tariff Law a tax upon net personal income in excess of $3,000 or $4,000 in case of a married couple. Surtaxes were also imposed which made the tax a progressive rate. In 1914 the yield was $28,000,000; in 1915, $41,000,000; and in 1916, $68,000,000. This was a disappointment to the supporters of the tax, but is accounted for partly because the law was not clear and the administration had not had experience in interpreting and enforcing its provisions. The yield of the corporation income tax was also not large, rising from $35,000,000 in 1913 to $57,000,000 in 1916.

The Democrats also determined to make a settlement of the banking difficulties which had hampered business for many years. In December 1913, the Federal Reserve Act was passed. This in part followed the plan proposed by the National Monetary Commission, previously referred to, but instead of creating one central bank provided for a central Federal Reserve Board with 12 regional banks. This new system was brought under the control of the government more strictly than was proposed in the original plan, by the requirement that the members of the Reserve Board be appointed by the President, and that the Secretary of the Treasury and the comptroller be ex-officio members of the board. The district banks hold the deposits of the government.

The European War (August 1914) quickly disturbed these new financial plans and it was necessary to add financial support to the treasury. Internal revenue duties were revised upward, 22 Oct. 1914, but the decline of customs duties and the falling off of duties from liquors owing to the spread of prohibition, more than offset the advance in rates. Increased expenditures were necessary in 1916 owing to troubles on the Mexican border and the need of providing for the new Shipping Board.

In his annual message, December 1915, President Wilson was finally aroused to the need of preparedness of this country and advocated an increase in the army and navy with corresponding financial legislation to meet these expenditures. The army appropriation bill consequently enacted called for an increase of more than $150,000,000; naval appropriations also were largely increased. Altogether the appropriations noted amounted to over $1,600,000,000, or more than $500,000,000 larger than in the previous year. The nation was started on the road of big finance.

President Wilson advocated a pay-as-you-go policy of taxation in preference to borrowing by the sale of bonds. While Congress did not follow the more specific recommendations of the President as to the kinds of taxes to be levied it did accept his general principle and enacted, on 9 Sept. 1916, a revenue measure designed to raise some $200,000,000. This

measure increased income tax rates, imposed a Federal inheritance tax and introduced the special tax on the profits of munitions makers. The performance of Congress was not equal to the need of the treasury and Congress again had to take up the question of further income. It increased the inheritance tax and introduced, from foreign financing, a new tax on excess profits of corporations and partnerships. These new taxes were calculated to raise about $250,000,000. In addition authority was given to make new loans of over $600,000,000. Thus the situation stood when Congress adjourned in March 1917.

The next month saw the declaration of war, with the necessity of financial operations only paralleled by the tremendous undertakings of Europe. There was much discussion as to whether the enormous expenditures should be met by taxation or by borrowing. There were two opposing opinions. One argued that the material for the war must be furnished by the existing population and that consequently the real cost of the war must at once be sustained. The other held that it was impracticable to take all the existing income by taxation without imperiling future production. A compromise was reached. Roughly a program of one-third taxation and two-thirds borrowing was adopted.

Income taxes were increased in October 1917 and higher super-taxes were imposed, the limit of exemption was lowered and the excess profits tax was increased upon a graduated scale. The result was seen in 1918 when the ordinary receipts were four billions ($4,179,000,000), or approximately four times that of the pre-war period. Of this total, customs duties produced an insignificant amount, $183,000,000; miscellaneous sources gave $300,000,000, and internal revenue taxes, $3,695,000,000. In this latter group, however, the new taxes on income and profits furnished more than three-fourths, or $2,839,000,000.

But the taxes of 1917, revolutionary as they were, were not sufficient for governmental needs. In the summer of 1918 Congress began the preparation of a bill to raise $8,000,000,000, but after the armistice in November the goal was set at $6,000,000,000. The chief increases were again in taxes on income, both of individuals and corporations, and on excess profits. The adoption of the constitutional amendment in favor of prohibition reduced the amount expected from the tax on beverages. Taxes on transportation, including railways, telephones and telegraphs, previously introduced in 1917, were continued and luxury taxes were added. But chief reliance was placed on the income and excess profits taxes. The act of February 1919 expects to raise more than three-fourths of the $6,000,000,000 from this source. For residents the normal rate is 6 per cent on the first $4,000 of net income above exemptions and 12 per cent on the remainder. In addition there are progressive surtaxes, reaching 65 per cent on incomes over a million dollars. The exemptions established in the act of October 1917, $1,000 for single persons and $2,000 for married persons and heads of families remained the same. The income tax as applied to corporations was expected to yield over $3,000,000,000 or about one-third of this total income.

In addition to taxation the government has made enormous loans. In 1917 and 1918 four Liberty loans were placed as follows:

First 3½s	$2,000,000,000
Second 4s	3,807,862,350
Third 4½s	4,176,516,850
Fourth 4½s	6,989,047,000
	$16,873,426,200

The rate of interest has gradually increased and for the Fifth Victory Loan (April 1919) the rate was advanced to 4¾ per cent. The issues vary in tax-exempt privileges, the first being practically free from all taxes, while the others, though free from the normal income tax, are sometimes taxable for super-taxes and excess profits taxes. In placing these loans an extraordinary effort was made to give them wide distribution. Allotments were made to the different sections, States and towns, the bonds were issued in small denominations and popular appeals were made to incite sacrifice and patriotic support. In this huge undertaking the Federal Reserve banks played an important part. Member banks have been able to rediscount loans secured by Liberty bonds.

Considering the enormous task suddenly imposed upon the government there is reason for satisfaction in the results accomplished. The government, however, has entered upon new fields of finance which will require new methods of financial operation. It is believed that peace budgets in the immediate future will not be less than $4,000,000,000 or four times that previously maintained.

Since 1861 there have been 24 secretaries of the treasury; the most distinguished among these are as follows: Chase, notwithstanding his lack of experience with fiscal affairs, displayed political shrewdness, devotion and integrity at a time when ordinary methods of finance had to be laid aside; Fessenden, his successor, during the closing months of the war, inspired confidence; McCulloch earnestly contended for an early resumption of specie payments and the retirement of the greenbacks; Boutwell in Grant's first administration carried through the refunding of the debt; Bristow in Grant's second administration attacked corruption in the internal revenue service and placed new insistence upon resumption; Sherman left a brilliant record in making resumption successful notwithstanding the opposing forces of inflation; Manning in Cleveland's first term strongly urged a moderation of the tariff and the repeal of the Bland Act; Carlisle in Cleveland's second administration upheld the credit of the government in the issue of bonds; Gage executed the provisions of the Currency Act of 1900; Shaw reorganized the details of the customs administration; and McAdoo showed energy and resourcefulness in managing the enormous loans of 1917 and 1918. As a whole, the treasury administration has been free from scandal. See also BANKS AND BANKING; MONEY.

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37. RECONSTRUCTION. With the surrender of the Southern armies and the collapse of the Confederate government all organized resistance to the authority of the United States was at an end, but a problem second only to that of suppressing the insurrection now confronted the nation. This was the question of the restoration of the late insurrectionary States to their normal relations in the Union and the determination of the political status of both those who had borne arms against the United States and those who had been made free by the results of the war. It was a great political and social problem, involving, on the one hand, the political reorganization or "reconstruction" of the Southern State governments which had carried on the war against the Union and, on the other, "the investment of the freedmen with the rights and privileges of citizenship and the protection of them in the enjoyment of those rights and privileges." The ideas and traditions of constitutional liberty in the United States made the problem especially difficult. In Europe indefinite military occupation would have been the solution of the problem so far as it related to political reconstruction, but that was repugnant to American ideas and was, therefore, not to be thought of.

Theories of Reconstruction.— It was admitted on all hands that the collapse of the Confederacy left the Southern States in an anomalous condition so far as their political status was concerned, but opinions varied widely as to the exact nature of that status. The framers of the Federal Constitution apparently did not foresee the possibility of civil war and consequently inserted no provisions in the fundamental law relative to the status of a State which having once seceded should be reconquered and brought again under the authority of the United States. As soon as the eventual defeat of the Confederate armies was foreseen discussion of the status of the Southern States, preliminary to the work of political reorganization, became active both in and out of Congress and several well-defined theories were enunciated. One of these was the view held by President Lincoln and his supporters that the act of rebellion in each State was the act of combinations of disloyal persons who had unlawfully subverted the State governments. The existence of the States themselves, he held, was not affected by the disloyal acts of their inhabitants although he admitted that as a result of rebellion the States were out of their "proper practical relations" with the Union. In his opinion, the problem of reconstruction consisted simply in placing the loyal element of each State in control of the government after which its normal relations with the Union could be resumed. By means of the executive pardon those who had engaged in rebellion could, upon promise of future loyalty, be restored to their rights and allowed to join with the loyal element in the re-establishment of the State government. This process would perhaps require the use of the military arm of the government but the intervention of Congress would not be necessary. Opposed to this lenient view was that of the more extreme radicals like Sumner and Stevens. According to their view the Southern States by act of rebellion had destroyed their corporate existence as self-governing commonwealths and should be held as conquered provinces or governed indefinitely as Territorial dependencies under the plenary power of Congress. A third and somewhat intermediate view was that finally adopted by Congress, namely, that the Southern States as a result of rebellion had "deprived themselves of all civil government" and had forfeited their rights of self-government. They continued to exist, but rather as disorganized communities, subject to the paramount authority of Congress to restore them to their rights as States under such conditions as it might prescribe. Other views of the status of the Southern States were but modifications of these three. It is to be noted that according to Lincoln's view the whole task of reconstruction was an executive problem, while according to the view finally reached by Congress it was a legislative problem, being derived from the constitutional provision which makes it the duty of the United States to guarantee to each State a republican form of government — a duty which had been interpreted by the Supreme Court as devolving upon the legislative branch. This difference of view led to important consequences and greatly complicated the whole process of reconstruction.

Executive Reconstruction.—As early as 1862 large portions of Arkansas, Louisiana and Tennessee having been occupied by the military forces of the United States, President Lincoln proceeded to administer these districts through officers called "military governors," who were vested with rather vague and undefined powers. After the fall of Gettysburg and Vicksburg the President, foreseeing the ultimate defeat of the Confederate armies, gave his attention to the working out of a more definite and systematic plan of reconstruction which could be applied to all the Southern States. Accordingly in his annual message to Congress in December 1863, he announced his plan which included an offer of amnesty to all persons who had served the Confederacy, except certain classes of men who had held high military or civil offices under the Confederate régime or who had resigned offices under the United States to engage in the Confederate service. Whenever a number of voters equal to one-tenth of the voters in 1860 had taken the amnesty oath to support the Constitution of the United States, and the proclamations of the President made during the war and had re-established a State government, republican in form, such government should receive the recognition of the executive, but whether its representatives in Congress should be allowed their seats was a question to be decided by each house. "Ten per cent" governments so called were accordingly established in Louisiana and Arkansas early in 1864 and representatives in Congress were duly elected but were refused admission to their seats in December 1864. Early in 1865 Tennessee was "reconstructed" according to the President's plan and representatives were chosen, but they likewise were refused their seats in the National House. In the meantime Congress was manifesting its disapproval of the executive method in a very substantial way. In July 1864 it passed the Wade-Davis bill for the reconstruction of the Southern States along lines radically different from those followed by the President. Mr. Lincoln refused to sign this bill before the expiration of the session and thus defeated it. In February 1865 Congress aimed another blow at

the executive method by the passage of a joint resolution which prohibited the counting of the electoral vote of any State that had passed an ordinance of secession. A breach between the President and Congress now seemed inevitable but had Mr. Lincoln lived it is highly probable that owing to his tact and influence with Congress the difficulties would have been settled in a manner satisfactory to Congress and to the great advantage of the Southern States. After the assassination of Mr. Lincoln, the Vice-President, Andrew Johnson, a man of far more aggressive and obstinate disposition, took up his policy without material change and carried it through only to have it all rejected by Congress. On 29 May 1865, President Johnson issued a proclamation of amnesty designed for the benefit of all who had not taken advantage of Mr. Lincoln's offer of 1863. It resembled Mr. Lincoln's proclamation in all essential particulars except that it excluded a large number of persons from the privileges of amnesty, among them all owners of $20,000 worth of property who had voluntarily enlisted in the Confederate service. Those who belonged to the excepted classes were allowed to make special application to the President, who agreed to extend such clemency as appeared to be consistent with the facts of the case and the peace and dignity of the United States. By subsequent proclamations President Johnson appointed "provisional governors" for North Carolina, Georgia, Mississippi, Alabama, South Carolina and Florida, the reconstruction of the other Southern States being regarded as already complete. These officials were directed to call conventions in their respective States for the purpose of amending their old constitutions so as to adapt them to the new conditions created by the results of the war, after which they were to be restored to their normal relations with the Union. Before the end of the year conventions had been held in all these States except Texas and they had adopted constitutional amendments either "repealing" the ordinances of secession or pronouncing them null and void. Likewise they had all abolished slavery, most of them had repudiated all debts incurred in aid of the rebellion and all but Mississippi and Florida had ratified the 13th Amendment to the Federal Constitution. Moreover they had held elections, chosen State officers and representatives in Congress and the legislatures had elected United States senators. When, therefore, Congress met in December 1865 for the first time since the close of the war, the President took great satisfaction in informing that body that all the late insurrectionary States except Texas, whose convention was not to meet until March of the following year, had been reconstructed and were ready to resume their constitutional places in the Union. Congress, however, ignored the whole scheme of reconstruction which Lincoln and Johnson had carried out, refused to admit the senators and representatives from the Southern States to seats in Congress and appointed a joint committee of 15 members to inquire into the condition of these States and report whether any of them were entitled to representation in Congress. One of the chief reasons which led Congress to veto the executive policy was the drastic character of the police legislation which some of these States had enacted in the summer and autumn of 1865 for the purpose, it was alleged, of keeping the negroes in a condition of involuntary servitude if not of actual slavery. The offense of vagrancy was so defined that few freedmen could escape punishment. Those who were unable to pay the fines imposed upon them were to be "sold out," their former masters being given the preference as lessees A harsh and unnecessary apprentice system for binding out colored minors was adopted. In Mississippi negroes were prohibited from renting or leasing land in incorporated towns and in most of the Southern States they were denied the right to give testimony in the courts except in cases in which negroes were parties. The demoralization of the negro race in 1865 was undoubtedly such as required stringent police measures to prevent crime and pauperism; but in singling out the black race for especial punishment the Southern legislatures greatly offended the sentiment of the North. In April 1866, Texas having complied with the requirements of the executive scheme of reconstruction, the President issued a proclamation officially declaring the rebellion at an end. In June the Reconstruction Committee made its report declaring that the Southern State governments established under the executive auspices were illegal (although they had been regarded as good enough to ratify the 13th Amendment), that Congress alone had authority to reconstruct these governments, and that guarantees of future security should be required as a condition of restoration to the Union. The committee recommended the denial of representation to these States until sufficient guarantees for the protection of the civil rights of the negro were forthcoming and that a portion of those guilty of having taken part in the rebellion be disfranchised from voting and disqualified from holding office.

Congressional Reconstruction. — When Congress met in December 1866 an effort was made to impeach the President (see UNITED STATES — IMPEACHMENTS) and the Tenure of Office Act was passed to limit his power of removal. His power, also, as commander-in-chief of the army and his power of clemency were abridged and a law was passed requiring the new Congress to meet on 4 March following. In February Congress passed in spite of the President's veto the first of the Reconstruction Acts for the more efficient government of the late insurrectionary States. This act grouped the said States into five military districts each of which was to be placed under the command of an army officer who was charged with the maintenance of order and the protection of property. The State governments were left intact but were declared to be provisional only and subject to the paramount authority of the United States. By a supplementary act of 19 March, likewise passed over the President's veto, the military commanders were directed to cause to be made a registration of the qualified voters without regard to race or color and to call a convention, if the majority of the voters were in favor of one, for the purpose of adopting a new constitution. When the constitution should be approved by Congress the State should be readmitted to representation in both houses of the National legislature. Military commanders were promptly appointed for the different districts and with adequate forces they

took possession and proceeded to govern the inhabitants according to the forms of military law. Arbitrary arrests were common, trial by jury was superseded by trial by military commission and various orders having the force of law were issued for the regulation of the conduct of the citizens. The new colored voters were registered, many of the old white voters were excluded for participation in the rebellion, conventions were chosen in all the Southern States by the new electorates and by May 1868 these conventions had all adopted constitutions establishing negro suffrage and disqualifying large numbers of white persons. In all the States except Mississippi, Texas and Virginia these constitutions were promptly ratified by the new electorates and in June they were readmitted to representation in Congress. In Mississippi, where a constitution containing several provisions of a proscriptive character had been framed, the whites after a determined campaign succeeded in defeating it at the polls. In Texas and Virginia, where likewise obnoxious provisions had been inserted in the constitutions, the reconstructionists were induced to delay indefinitely submission to the people. These three States, therefore, continued under military rule. In the meantime the legislature of Georgia having excluded the negro members-elect from their seats, the United States Senate refused to admit the senators from that State to seats in Congress. Consequently at the time of the accession of President Grant four of the Southern States were still unrestored to their constitutional positions in the Union. He was induced to recommend to Congress the resubmission of the constitutions of Mississippi and Virginia to the voters in such a way as to enable them to vote separately upon the obnoxious provisions. Congress so directed; the constitutions were resubmitted, and were ratified without the objectionable provisions. By the same act Congress directed the submission of the Texas constitution to the people and it was duly ratified. These three States were punished for their tardiness by the imposition of an additional condition precedent to restoration, namely, the ratification of the 15th Amendment. Early in 1870, having complied with this additional requirement they were readmitted to representation in Congress and restored to their full positions in the Union. Finally after having been twice reconstructed Georgia complied with the new conditions imposed by Congress and in June was likewise restored to her place under the Constitution. The military governments now gave way to the State governments, Federal interference was withdrawn and reconstruction technically at least was completed.

Civil and Political Rights for Freedmen. — Slavery having been abolished by the 13th Amendment, adopted in 1865, the investment of the negro with civil rights followed as a necessary incident of his new status. Some of the Southern legislatures in 1865 passed laws denying the freedmen the right to own real estate in some cases and to give testimony in the courts and having otherwise abridged their civil rights, Congress in April 1866 passed over the President's veto the noted Civil Rights Act which conferred upon all persons of color the status of citizenship and placed them upon an equality with white citizens in the making and enforcing of contracts, in suing and giving testimony in the courts, in acquiring, holding and conveying real as well as personal property and in the enjoyment of equal protection of the laws for the security of person and property. The United States courts were given jurisdiction of cases arising under the act and the President was empowered to use the army and navy to enforce it. Foreseeing the possible return to power of those opposed to civil rights for the negro and the consequent repeal of the act, Congress immediately proposed the 14th Amendment, embodying the principles of the Civil Rights Act. To incorporate it in the Constitution would have the effect of placing the civil rights of the negro beyond the reach of any hostile Congress. Ratification of this amendment by the Southern States was made a condition precedent to their restoration to the Union. Finally, in July 1868, Congress declared that the amendment had been ratified by the requisite number of States and was, therefore, proclaimed a part of the Constitution. The amendment declared that all persons born or naturalized in the United States and subject to the jurisdiction thereof are citizens of the United States and of the State in which they reside; provided for a reduction of the representation in Congress of any State that should deny the suffrage to any of its adult male citizens; disqualified many of the prominent ex-Confederates from holding Federal office; invalidated all debts and other obligations incurred in aid of the rebellion and prohibited the States from abridging the privileges of citizens or denying to any person the equal protection of the laws. By the threat of reducing their representation in Congress the nation offered an inducement to the Southern States to give the negro the right of suffrage, but it was soon discovered to be insufficient, and in February 1869 a new amendment (the 15th) was proposed which declared that the right to vote should not be denied or abridged by the United States or by any State on account of race, color or previous condition of servitude. Ratification of this amendment was imposed as a condition precedent to the readmission of the four States of Mississippi, Texas, Virginia and Georgia, which still remained under military government and without representation in Congress. By March 1870 the requisite number of States had ratified the amendment and it was proclaimed a part of the fundamental law. Although this important amendment did not directly confer the suffrage upon the negro it did confer upon him an exemption from discrimination upon the part of any State in fixing the qualifications for voting. Having secured full civil and political rights for colored citizens, the Republican leaders now undertook, by an act of March 1875, to secure social equality for all colored persons in hotels, public conveyances, theatres and other places of public amusement, but the Supreme Court held the act void as beyond the power of Congress.

The Freedmen's Bureau. — One of the agencies through which the process of reconstruction was worked out was the Freedmen's Bureau, first established in March 1865 and placed under the supervision of the War Department. In general, its purpose was to aid and advise the large number of freedmen who were demoralized and made helpless as a result

of sudden liberation. During the last years of the war thousands of blacks left the plantations and gathered about the camps or followed in the wake of the Federal armies. To provide for their support was a difficult problem which every commander in the South had to meet. At first appeals were made to philanthropic persons of the North for funds with which to support this class, and generous responses followed, but as the end of the war approached the number of negro "contrabands" increased until it was found impossible to rely wholly upon the support of charitable relief. Being released from the restraints of slavery, many freedmen made good use of their liberty to quit work and wander about the country only to find themselves, after a brief season, in a state of destitution. Others who continued to labor on the farms of their former masters were sometimes taken advantage of in regard to labor contracts and were denied the rights of free men which the results of the war had brought them. The bureau undertook to provide hospitals and medical relief for the sick and infirm; it distributed large quantities of food to the destitute; it undertook to prevent the infringement of the civil rights of freedmen; it provided special courts for the trial of accused freedmen in all cases in which the State excluded the testimony of colored witnesses; it examined and approved their labor contracts; it circulated the emancipation proclamation among the blacks of the remote districts; it instructed them as to their new duties and responsibilities; it urged them to labor and impressed upon them the sacredness of the marriage contract; it established schools and supplied teachers to such communities as wished them and in various other ways undertook to aid the unfortunate blacks whom emancipation had left to shift for themselves. The officials of the bureau also used their influence with the credulous blacks to induce them to enter into labor contracts with planters and thus performed a service not without value to the white race.

The organization of the bureau was quite elaborate. Its head was a commissioner, this office being held by Gen. O. O. Howard (q.v.); there was an assistant commissioner for each State and a number of sub-commissioners, each in charge of a particular district of the State. In every locality was stationed an agent who acquainted the freedmen with the orders of the bureau, distributed the rations and performed various other duties. The law as passed in 1865 made no appropriation for the support of the bureau, but its income from the sale of certain confiscated property and the rent of abandoned lands was sufficient to meet expenses. In July 1866 a new act was passed and the operations of the bureau largely extended. It was not finally withdrawn from all the Southern States until 1872. Although the bureau accomplished some good it did not promote the harmonious relations between the two races which it was expected to do. The agents of the bureau were mostly subordinate military officers and a considerable number of them turned out to be inefficient and unscrupulous. Too ofter able-bodied freedmen were encouraged in their idle habits by the distribution of government rations, while in not a few cases they were led to believe that the lands were to be distributed among them. Likewise it frequently happened that the zeal of the bureau officials for the enforcement of exaggerated rights led to violent conflicts between white citizens and the military forces which were at the disposal of the bureau.

The "Carpet-Bag" Régime.— The reconstruction acts by enfranchising the negroes and disqualifying large numbers of the more influential whites made it possible for the blacks to get possession of the governments in most of the Southern States and to rule them in a most ignorant and extravagant manner. They were made use of by unprincipled adventurers from the North who flocked to the South in considerable numbers after the close of the war, some to engage in the profitable industry of cotton planting, others to fill the offices from which the more prominent Southern whites were excluded. These Northern immigrants came to be called "carpet-baggers" by the native whites, in allusion to the popular assertion that all their worldly effects were carried in a carpet-bag. By no means all of the Northern men who came to the South at this time were unscrupulous adventurers bent upon plunder, but they all allied themselves on the side of the negro in political matters, thus increasing the bitterness of race antagonism. A few native Southerns — "scalawags," they were called — also allied themselves politically with the Northern men and negroes for the purpose of sharing in the offices. Both these classes of whites were bitterly hated by the native Southern element who saw themselves excluded from power by strangers and others who had little substantial interest in the State. The influence of the carpet-bag class over the negroes was at first very great. They organized the freedmen into political clubs, instructed them in the art of voting and made use of them to further their own political ambitions. The carpet-baggers secured the nominations to the more important offices and were easily elected by large black majorities. But the colored voters were not content to see all the offices held by their white allies, and their ambition was frequently too great to be ignored. Consequently many of the important offices came to be held by ignorant blacks who but a few years previous were field-hands on the plantations. In several States negroes filled the offices of lieutenant-governor, secretary of state, superintendent of education and other important offices. In some instances they even sat upon the benches of the higher courts, while they filled many minor judicial positions. They occupied seats in the legislatures of all the Southern States, that of Mississippi in 1871 having as many as 55 colored members. A considerable portion of these were ignorant, some of whom were unable to read or write and all of whom were the pliant dupes of unscrupulous Northern men. With the State and local governments controlled by ignorant negroes and designing white men, an era of extravagance, misrule and corruption set in which in some instances amounted to outright robbery and plunder. Long and frequent sessions of the legislature were held for service in which the members voted themselves large per diem allowances. Old laws were ruthlessly repealed and replaced by bulky statutes, many of which bore the ear marks of animosity and oppression. Counties were

rechristened with names full of offense to Southern whites. Laws favoring social equality were passed. Public school systems on an extravagant scale for the children of both races were established and taught by Northern teachers. Offices were greatly multiplied — many of them mere sinecures — for the benefit of good Republicans. Gigantic schemes of public improvement were undertaken, most of which were marked by frauds and extravagance. The rate of taxation was increased out of all proportion to the ability of the people to pay in their then impoverished condition resulting from four years of destructive war. In Mississippi this rate was increased from one mill on the dollar in 1868 to 14 mills in 1871, and the inability of the people to pay resulted in the confiscation of one-fifth of the land of the State. Large debts were incurred for projected improvements, especially in Louisiana and South Carolina, where a wholesale system of plunder was carried out by the reconstruction governments. In the latter State the public debt was increased from $5,000,000 in 1868 to nearly $20,000,000 in 1874. The tax levy was increased four-fold, although the value of taxable property had declined 100 per cent. Large gratuities were voted State officials, the State capitol was furnished after the manner of a European palace and vast sums were squandered in reckless schemes for public improvement.

Under these conditions the taxpayers grew restless and disorders began to occur here and there. They naturally chafed under the rule of their former slaves who were controlled by strangers possessing no permanent interest in the South. Wherever the negroes were in the majority they carried the elections and controlled the government. The extravagance and corruption of their rule aroused the whites to adopt concerted measures for counteracting the political power of the negroes by terrifying them and keeping them away from the polls at election times. This was effectively accomplished by the organization of secret bands, the best known of which was the so-called Ku-Klux Klan, said to have originated in Giles County, Tenn., in 1866. At first it was intended to serve as a disciplinary organization for scaring the superstitious blacks into good behavior, but with the ascendency of the negro to political power with its resulting imbecility and corruption the purposes of the Ku-Klux Klan were changed to meet the new situation. Its jurisdiction was styled the «Invisible Empire»; the chief functionary was the Grand Wizard; each State was a realm ruled over by a Grand Dragon. Then there were Dominions, Provinces and Dens presided over by Grand Titans, Grand Cyclopses, Ghouls, etc. The organization was elaborate and mysterious; there was a constitution and a solemn ritual and a gruesome mode of initiation. All of which appealed to the curious and at the same time excited the fear of the superstitious blacks. The members of the Klan when in service wore hideous disguises, the sight of which terrified the negroes and sent them running to their cabins. Prominent negro politicians, obnoxious carpet-baggers and scalawags, Northern teachers of negro schools, were the most common victims of the Ku-Klux activities. Usually the Klan made known its orders by a warning couched in mysterious language, but always intelligible enough to convey its meaning. After the withdrawal from the South of the military governments between 1868 and 1870 Ku-Klux outrages threatened the peace and security of the South. Republican legislatures passed anti-Ku-Klux acts and Republican governors offered large rewards for persons guilty of going in disguise to commit crime, but public sentiment was too much in favor of Ku-Klux methods to make either effective. Besides, it was next to impossible to convict anyone if caught and put on trial. Upon the recommendation of President Grant Congress appointed a joint committee to make a thorough investigation of conditions in the South and the voluminous testimony which it took showed conclusively that hundreds of murders had been committed in the Southern States by Ku-Klux bands, besides many outrages of a less flagrant character. To meet the situation Congress passed, in 1870, the so-called Enforcement Act giving the Federal courts jurisdiction over certain offenses committed with the intent of depriving colored persons of their rights as citizens of the United States. In April of the following year Congress passed another Enforcement Act which further extended the jurisdiction of the United States courts and authorized the President to employ the army and navy and to suspend the writ of habeas corpus if necessary to put an end to Ku-Klux outrages. It also empowered Federal judges to exclude from juries persons believed to be in sympathy with the Klan. In pursuance of this act the Federal attorneys in the Southern States made special exertions to secure the indictment of those engaged in the Ku-Klux outrages and hundreds of indictments were found, but few convictions followed, owing to the sympathy of the juries for the accused. Acts were also passed for the supervision of Federal elections in the hope of securing to colored voters the unobstructed enjoyment of the right of suffrage which the 15th Amendment had conferred upon them. But all the efforts of Congress to secure the political rights of the freedmen failed because it involved negro domination and this had proved intolerable to the whites. See KU-KLUX KLAN.

The Undoing of Reconstruction. — For a time the reconstructionists in the South were able, with the air of Federal troops, to maintain their power, but as the extravagance and corruption of their rule increased the discontent of the native whites, who were the chief sufferers, became more general. Organized intimidation and ballot-box frauds were openly committed for the purpose of defeating the Republicans in the elections. Race collisions and election riots were of frequent occurrence, and in all of them the blacks were the chief sufferers. In several States rival governments were set up and civil war threatened. Negro militia companies were organized, but they were ineffective and served only to inflame the passions of the whites and increase their determination to overthrow the Republican government by violence. The government at Washington showed less readiness to call out troops to interfere at the elections and a growing disposition to leave the Southern State governments to take care of themselves. Under these as early as 1870 the Democrats had regained control of North Carolina, Tennessee, Texas, Georgia and Virginia. Meantime the progress of the Southern movement was aided

by the wholesale removal by Congress of the political disabilities of the Southern whites and the division of the Southern Republicans into radical and conservative wings, the latter of which joined with the Democratic organizations. In 1874 Alabama and Arkansas were carried by the Democrats and the carpet-bag governments in those States came to an end. In the following year, after a remarkable campaign, characterized by violence, riots and wholesale intimidation, Mississippi was carried by the Democrats, who speedily got rid of three of the State officers, including the governor, by means of impeachment. In the following year the "Mississippi plan" was employed with success in the three remaining Southern States which were still "unreclaimed," namely, Louisiana, Texas and Florida. Solid Democratic delegations were now sent to Washington, most of the carpet-baggers returned to the North and the Southern whites were left in control. The subsequent disfranchisement of the negro race in Mississippi, Louisiana, South Carolina, Alabama, North Carolina and Virginia and the judicial approval by the Supreme Court of these disfranchising constitutions ensured the permanent rule of the white race and thus marked the final and complete undoing of reconstruction so far as its political effects were concerned.

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38. THE THIRTEENTH, FOURTEENTH AND FIFTEENTH AMENDMENTS TO THE CONSTITUTION. These three amendments to the Constitution are popularly known as the War Amendments. This designation is not without justification in their origin. The difficulties involved in amending the Constitution are so great that but for the conflict with which in the popular mind these amendments are associated, it is doubtful if the principles which they embody could ever have been incorporated into it. These amending articles primarily concerned the negro race and their adoption marked the transition of these people from slavery to citizenship. They meant that within a period of five years more had been accomplished than had been by half a century of polemical discussion. They embodied the results of such a revolution of public sentiment as only war could have effected. The emancipation of the American negro was never a more remote probability than at the outbreak of the Civil War. Almost the entire time of the last session of the 36th Congress, 3 Dec. 1860 to 2 March 1861, was devoted to the consideration of various measures calculated to compromise sectional differences. Every plan proposed had as its basis an effort more specifically to guarantee against outside interference the institution of slavery in the States wherein it then existed. On 11 Feb. 1861, without a dissenting vote the House agreed to a resolution of Mr. Sherman of Ohio which indicated the spirit of that body. It declared that neither Congress nor the people of the non-slave-holding States had any right to interfere with the institution in any State in which it was established. A few days later the House went much further than this, and by a vote of 133 to 65 passed the Corwin Resolution, proposing an amendment to the Constitution. This provided that the Constitution should never be so amended as to empower Congress in any way to interfere with slavery in the States. It is significant of the sentiment which then pervaded the country that this resolution secured the support of such men as Charles Francis Adams, Schuyler Colfax, Henry Winter Davis, Justin S. Morrill and John Sherman. On the last day of the session, 2 March it received the constitutional majority in the Senate and was duly proposed to the country as the Thirteenth Amendment. Few more striking contrasts are presented in the history of the development of the Constitution than that between the amendment with which Congress would thus have commemorated the opening of the great conflict and the one which marked its close. This resolution was ratified by Ohio, Maryland and Illinois, but its fate possesses scant interest now, if indeed it did even at that time. Men soon realized that the hour of compromise had passed — that the great issues which had so long disturbed the repose of the country had been removed from the halls of Congress and submitted to the arbitrament of the sword.

Mr. Lincoln's attitude at this time was thoroughly in accord with that of Congress. In his inaugural address he declared that he had no purpose, inclination or right to interfere with slavery in the States. To emphasize his position he quoted from the platform on which he had been elected and also declared that as in his opinion the proposed Corwin amendment was already "implied constitutional law" he had "no objection to its being made express and irrevocable." There can be no question that in these declarations Mr. Lincoln gave expression to his most earnest convictions. The fact that

within two years after he uttered them he felt compelled, "upon military necessity," to issue the Emancipation Proclamation affords some idea of the significance and magnitude of the events which made for the first of the war amendments. When, on 1 Jan. 1863, Mr. Lincoln followed his provisional proclamation of the preceding September by one unconditional in its terms, no one knew better than he that it was literally no more than it purported to be on its face — a war measure, pure and simple. The Emancipation Proclamation designated certain States and parts of States within the field of military operations as "in rebellion," and declared free all slaves within such districts. It advised the slaves so emancipated to labor for wages and to refrain from acts of violence and announced that they would be received into the armed service of the government. Such a proclamation was mere *brutum fulmen* without military force behind it. It meant no more to the slaves in territory not actually occupied by the Union army, so far as their status at that time was concerned, than a piece of blank paper. Its immediate effectiveness anywhere was dependent upon the force of arms, the perpetuity of its declarations upon the ultimate outcome of war. The very limitations which its own terms placed upon its geographic application carried with them the necessity of a constitutional ratification in order to render the principle enunciated both general and permanent. From the date of that document another amendment to the Constitution became an event contingent only upon the triumph of Union arms.

The Thirteenth Amendment.— It is one of the singular turns of the history of anti-slavery agitation that although New England had been so long identified with the abolition movement, it should fall to the lot of a man from a Western slave State to formulate and introduce the amendment which was to write into the Constitution the fulfilment of the highest hopes of Garrison and Phillips. It was Mr. Henderson of Missouri, who on 11 Jan. 1864 introduced in the Senate the joint resolution which became the 13th Amendment. This resolution, somewhat amended by the Judiciary Committee, passed the Senate on 8 April by a vote of 38 to 6. Abolition sentiment had not gained ground rapidly in Congress. That body had put itself on record many times as carrying on the war for the sole purpose of preserving the Union. As late as 22 and 25 July 1861, after the battle of Bull Run, the Crittenden resolutions declared that the war was not waged "for the purpose of overthrowing or interfering with the rights or established institutions" of the Southern States. These resolutions had been agreed to in the House with but two negative votes and in the Senate but five were recorded against them. There were also many members who realized that slavery was doomed, but were unwilling formally to put themselves on record as co-operating in its destruction. It was not surprising then that the Henderson resolution was rejected when it came up in the House on 15 June. But 95 votes were cast in its favor. The election of 1864 determined beyond all question that the country endorsed Mr. Lincoln's administration. This meant more than mere approval of his course in conducting the war. The Emancipation Proclamation and an amendment to give it effect upon the restoration of peace were just as truly issues of that election as was any other feature of the administration. From the first the President had been a champion of the Henderson resolution and he was quick to take advantage of the result of the election in urging upon the House the necessity of its passage. This he did in his annual message of 6 Dec. 1864. He called the attention of the House to the result of the recent contest, and told them that it meant the passage of the measure by the next Congress, if it failed in this. He declared the election to be "the voice of the people now, for the first time heard upon the question" at issue. We need not consider which most influenced their action, Mr. Lincoln's message or the determination to accept an accomplished fact. On 31 Jan. 1865, by a vote of 121 to 24, the House finally passed the resolution as it came from the Senate: Section 1. Neither slavery nor involuntary servitude, except as a punishment for crime whereof the party shall have been duly convicted, shall exist within the United States, or any place subject to their jurisdiction. Section 2. Congress shall have power to enforce this article by appropriate legislation. On 18 Dec. 1865, the 13th Amendment was declared a part of the Constitution.

The Fourteenth Amendment.— On the first day of the memorable 39th Congress, 4 Dec. 1865, Mr. Stevens submitted a resolution providing for a joint committee of 15 to inquire into the affairs of "the so-called Confederate States." The resolution created what became known as the Reconstruction Committee. To this committee was referred every bill, resolution or petition bearing upon any phase of the relations between the Southern States and the general government, or involving consideration of the future status of the negro. The only result of their labors in which we are interested was submitted to both Houses on 30 April 1866, as their plan for the reconstruction of the Southern States. This consisted of three features, embraced in a joint resolution, proposing a constitutional amendment and two bills. The three combined did not differ greatly from the 14th Amendment as finally adopted. The first section of the joint resolution did not contain a definition of national citizenship. In other respects it was the same as that adopted. Its second section, reducing representation for suffrage abridgment, was adopted substantially as reported. Section 3 deprived of the right to vote for electors or representatives until 4 July 1870, all those in any way identified with the "late insurrection." One of the bills reported as part of this plan provided for rendering ineligible to office certain proscribed classes of men in the Southern States. This bill formed the basis of the third section of the amendment as adopted, in lieu of the one reported by the committee. The fourth section was similar to the fourth section of the amendment, except that it did not contain the provision as to the validity of the public debt. The first of the bills reported provided that when the amendment proposed therein should have become part of the Constitution, and been ratified by "any State lately in insurrection," the senators and representatives from such State "might" ["may"] be admitted into Congress as such." This bill did not pass either House, nor did Congress com-

mit itself in any way to the policy suggested by it,— that of admitting the Southern States upon their ratification of the proposed amendment. The House passed this joint resolution just as it came from the committee, the Senate making the amendments outlined above. These modifications brought the resolution to the shape in which it now stands as the 14th Amendment. The Senate passed it 8 June 1866 by a vote of 33 to 11. On 13 June the House agreed to the Senate amendments by a vote of 138 to 36. A study in detail of the ratification of this amendment would take us further afield than we can go, for here the history of the amendments and that of Reconstruction so blend as to become difficult of separate treatment. Thus would be opened up the whole question of the rejection of the amendment by the Southern States, save Tennessee, and of the effect of such rejection upon the subsequent action of Congress toward those States in the matter of negro suffrage and the last amendment. In the process of Reconstruction ratification became, in specific terms, a condition precedent to the readmission of the Southern States, and was declared accomplished in Seward's proclamations of 20 and 28 July 1868.

THE FOURTEENTH AMENDMENT.

Section 1. All persons born or naturalized in the United States, and subject to the jurisdiction thereof, are citizens of the United States and of the State wherein they reside. No State shall make or enforce any law which shall abridge the privileges or immunities of citizens of the United States; nor shall any State deprive any person of life, liberty, or property without due process of law; nor deny to any person within its jurisdiction the equal protection of the laws.

Section 2. Representatives shall be apportioned among the several States according to their respective numbers, counting the whole number of persons in each State, excluding Indians not taxed. But when the right to vote at any election for the choice of electors for President and Vice President of the United States, representatives in Congress, the executive and judicial officers of a State, or the members of the Legislature thereof, is denied to any of the male inhabitants of such State, being 21 years of age, and citizens of the United States, or in any way abridged, except for participation in rebellion, or other crime, the basis of representation therein shall be reduced in the proportion which the number of such male citizens shall bear to the whole number of male citizens 21 years of age in such State.

Section. 3. No person shall be a senator or representative in Congress, or elector of President and Vice President, or hold any office, civil or military, under the United States, or under any State, who, having previously taken an oath, as a member of Congress, or as an officer of the United States, or as a member of any State legislature, or as an executive or judicial officer of any State, to support the Constitution of the United States, shall have engaged in insurrection or rebellion against the same, or given aid or comfort to the enemies thereof. But Congress may, by a two-thirds vote of each House, remove such disability.

Section 4. The validity of the public debt of the United States, authorized by law, including debts incurred for pensions and bounties for services in suppressing insurrection or rebellion, shall not be questioned. But neither the United States nor any State shall assume or pay any debt or obligation incurred in aid of insurrection or rebellion against the United States, or any claim for the loss or emancipation of any slave; but all such debts, obligations, and claims shall be held illegal and void.

Section 5. The Congress shall have power to enforce, by appropriate legislation, the provisions of this article.

The Fifteenth Amendment.— Propositions having negro suffrage as an end were almost as numerous during this period as were similar efforts toward an emancipation measure prior to 1865. Indeed, one of the most frequently suggested means of enforcing the 13th Amendment was by conferring suffrage upon the freedmen. Limitations of space render it impossible to trace here the evolution of the 15th Amendment through these numerous bills and resolutions. It has been noticed above that the author of the 13th Amendment was a senator from a Western slave State,— Mr. Henderson of Missouri. It is even more singular that the same man should also have introduced the resolution which became the 15th. Early in the first session of the 40th Congress, 7 March 1867, Mr. Henderson introduced a resolution proposing an amendment to the Constitution which would prohibit a State from abridging the right "to vote or hold office on account of race, color or previous condition." The 40th Congress had three sessions, and the Henderson resolution slept in the Judiciary Committee until well along toward the close of the third. It was reported by Senator Stewart, on 15 Jan. 1869, amended to read as follows:

"The right of citizens of the United States to vote and hold office shall not be denied or abridged by the United States, or any State, on account of race, color, or previous condition of servitude."

The Senate passed this resolution on 17 February. The House amended it by striking out the words "by the United States," which would have left Congress with absolute control over negro suffrage. It also added to the grounds upon which suffrage abridgment was denied the States those of nativity, property and creed. The House had just refused to accept from the Senate such an amendment to a resolution of its own. Its action now, in tacking this on to the Senate measure, showed an utter absence of anything like agreement between the two bodies as to the precise form of the amendment. The situation finally yielded to considerations of party expediency, and the House acceded to the Senate's request for a conference. This resulted in a recommendation that the House recede from its amendments and agree to the Senate resolution. The latter, however, was to be amended by striking out the words "and hold office." Here was another important compromise to be engrafted on the Constitution, whereby was secured the 15th Amendment as we have it to-day.

THE FIFTEENTH AMENDMENT.

SECTION 1. The right of citizens of the United States to vote shall not be denied or abridged by the United States, or by any State, on account of race, color, or previous condition of servitude.

SECTION 2. The Congress shall have power to enforce this article by appropriate legislation.

Under the operation of the previous question the House was able to secure an agreement to this report as soon as submitted, 25 February. In the Senate, however, serious opposition developed among the friends of the measure. It was claimed that too great a sacrifice to expediency had been made in striking out the words "and hold office," and thus reducing the scope of the amendment to the matter of suffrage alone. On this account Mr. Edmunds, one of the managers at the conference, had refused to sign the report, and now opposed the amended measure on the floor of the Senate. The session was drawing to a close, and perhaps there was something in the taunt of the minority that the dominant party dare not trust the fate of the measure to the succeeding Congress. Though markedly earnest, the debate was not protracted. The Senate passed the resolution on 26 February. On 3

March Congress adjourned. In the unusual form of a special message from the President, communicating its promulgation by the Secretary of State, the last of the War Amendments was declared adopted on 30 March 1870.

Validity and Enforcement.— The charge of "irregularity," of a departure from established constitutional methods, was made by the minority against all the legislation enacted by Congress during the eventful years covering the period of Congressional Reconstruction. It was urged with greater force against the validity of the action by which the passage and adoption of these amendments were secured. Against the 13th was brought the charge that West Virginia, whose ratification was declared necessary, had been created a State in disregard of the letter and spirit of the Constitution. The question of the right of a State to rescind a ratification once given was raised in the case of the 14th and 15th, as also the constitutionality of the entire plan of Congressional Reconstruction. It was not long, however, before the minority realized the necessity and wisdom of accepting the amendments as a matter of public policy. By February 1872 both parties in the House had gone on record as formally recognizing their validity, and the question ceased to possess more than a mere academic interest. The energy and earnestness of the Reconstruction statesmen were not exhausted with the adoption of the amendments. Immediately following the ratification of each one they set to work to enforce its provisions with the same determination which had characterized their efforts to secure its incorporation into the organic law. Various acts, some directed against peonage in New Mexico, others against the kidnapping of negro children, were passed to render impossible the placing or retaining of anyone in a state of involuntary servitude. The principal act for enforcing the 13th Amendment clearly anticipated important provisions of the succeeding amendment. This was the Civil Rights Bill of 9 April 1866. The emancipating amendment left the late slaves in an anomalous position, and to meet the difficulties of their situation was the prime object of this elaborate measure. It declared all persons born in the United States, not subject to a foreign power, except Indians not taxed, citizens of the United States. Here we have a near approach to the definition of national citizenship contained in the first section of the 14th Amendment. It gave to every citizen so defined the same rights of property, and the same protection of person and property, enjoyed by the white citizen. It provided extraordinary means, judicial and executive, for its own enforcement, and for guaranteeing protection to all persons in their "constitutional rights of equality before the law." This act was passed over Johnson's veto more than two years before the adoption of the 14th Amendment, yet it served the purpose of an enforcing act for that amendment long after its ratification. Indeed, it answered that purpose, without even being amended, until after the ratification of the 15th Amendment. These enforcing acts themselves illustrate the process of development through which the negro passed in his transition from slavery to citizenship. They reflect the views of their framers as to the significance of each step taken in that movement. Thus it appears that an act merely to enforce the emancipating amendment was considered broad enough to cover the first section of the 14th also. Extreme views were entertained as to the power of Congress in regard to the matters covered by the amendments. The last two were not proposed by Congress because that body doubted its constitutional right to accomplish the same ends by legislation, but simply to remove those matters beyond the reach of a possible hostile majority. The next enforcing act was that of 31 May 1870. This was "to enforce the right of citizens of the United States to vote," but it also re-enacted, with some additional provisions, the Civil Rights Bill of 1866. Means were provided for preventing suffrage discriminations on account of color under almost any contingency that could rise. The act also provided for enforcing the third section of the 14th Amendment, prohibiting certain classes in the Southern States from holding office. This act was amended 28 Feb. 1871, by one which provided still more elaborate machinery for enforcing the right to vote. Among other features it required judges of United States Circuit Courts to appoint supervisors of Congressional elections, upon petition of two citizens. This, however, applied only to cities of at least 20,000 inhabitants. The Act of 20 April 1871 was the first specifically directed to the enforcement of the 14th Amendment. This was known as the Ku-Klux Act, and of all the enforcing laws it was the most drastic. The others conferred upon the Federal Courts jurisdiction for acts in violation of their provisions, and for their enforcement placed at the call of even petty officials the military and naval branches of the government. This authorized the President in certain contingencies to suspend the privileges of the writ of habeas corpus. It was directed primarily against alleged conspiracies in the Southern States to render inoperative the first section of the 14th Amendment. The second and last act to enforce the first section was the Civil Rights Act of 1 March 1875. The first two sections of the act attempted to do for the newly-declared citizens, in the sphere of what may be called social privileges, what the Civil Rights Bill of 1866 had done in the field of property rights. They declared all persons within the jurisdiction of the United States "entitled to the full and equal enjoyment of the accommodations, advantages, facilities and privileges of inns, public conveyances on land or water, theatres, and other places of public amusement." Infractions of this act gave rise to the Civil Rights Cases, which furnished the occasion for one of the most important interpretations of the 14th Amendment ever announced by the Supreme Court. The one section of the 14th Amendment which has never been enforced is the second,— which provides for reducing the representation of States as a penalty for abridgments of the suffrage. Some of the men most prominent in Reconstruction legislation have announced the opinion that this section was rendered nugatory by the adoption of the 15th Amendment. This question, however, has not been passed upon, in the absence of enforcing legislation. Such legislation was attempted in the first apportionment act after the new amendment, that under the census of 1870. It was at once discovered that the question was

one involving numerous practical difficultics,— difficulties probably unforeseen by the framers of the section, certainly entirely unprovided for by them. The advocates of changing the basis of representation in accordance with the new provision had finally to content themselves with merely restating in the Apportionment Act the penalty provided in the amendment itself.

Interpretation.— The 14th Amendment has overshadowed the other two, alike in the number and the importance of the cases involving its interpretation by the Supreme Court. A consideration of the three amendments shows this to have been inevitably incident to the nature of the 14th. The 13th and 15th were simple and direct in terms, each covering a single question. Article IV of the Constitution declared the citizens of each State entitled to all the privileges and immunities of citizens in the several States. Article V of the amendments declared that no person should be deprived of life, liberty or property without due process of law. But Article V was operative upon the general government, not upon the States. The 14th Amendment for the first time defined national citizenship, and endowed it with the privileges and immunities hitherto the attributes of citizens of the States. It then went further, and prohibited the States from abridging these privileges and immunities in their new and broadened application. It borrowed and brought forward from the 5th Amendment the guaranty of due process of law, and decreed that henceforth the denial thereof should also be beyond the province of the State. In their new relation, the questions, what are the privileges and immunities of citizens? What is due process of law? and what the equal protection of the laws? are capable of being raised under an almost infinite variety of circumstances. They assume a new significance and issues of consequence and moment are involved in their determination.

The amendment of which this first section is the most important part was formulated by a Congress which convened almost before the din of war had died away. It was written of it, by the speaker of its house, that "Its keynote of policy was protection to the downtrodden." Some members of that body may have been gifted with the prescience to see beyond the strife and partisanship of the hour — but these were few. Such as they may have realized the true import of the measure thus wrought out in the heat and bitterness of debate. One or two did indeed predict its future. But of the many whose voices gave it the sanctity of constitutional law with truth it may be said that only the freedman was in their view. The first case which involved the interpretation of this amendment by Supreme Court discloses this view of restricted application. This was in the famous Slaughter House Cases, decided 14 April 1873. In behalf of the majority of the court, Mr. Justice Miller expressed this opinion: "We doubt very much whether any action of a State not directed by way of discrimination against the negroes as a class, or on account of their race, will ever be held to come within the purview of this provision. It is so clearly a provision for that race and that emergency, that a strong case would be necessary for its application to any other." But the Constitution was "made to march" during the succeeding quarter-century. In 1898, in Holden v. Hardy, we find the court declaring that "A majority of the cases which have since arisen have turned not upon a denial to the colored race of rights therein secured to them, but upon alleged discriminations in matters entirely outside of the political relations of the parties aggrieved." Doubtless it would be a pleasing reflection that the later and larger interpretation of this amendment was the one contemplated by its framers. But this would not be warranted by the facts. The decisions nearest the amendment in point of time are nearest also to the intent of most of those who gave it life. The measure would scarcely have appealed to men from the Pacific Coast had they foreseen the construction to be placed upon their work in the cases of Yick Wo v. Hopkins and the United States v. Wong Kim Ark. In the case of Yick Wo, Chinese, as "persons," were held to be entitled to "due process of law." In Wong Kim Ark it was held that children born in the United States of Chinese parents having their domicile here are citizens of the United States. The effect of the former of these decisions was to give to the word "person" the broadest possible significance, as meaning every natural person within the jurisdiction of a State. But there was another class of persons to claim the protection of the amendment. Corporations came forward with the sound argument that they were mere associations of persons, each of whom was guaranteed due process of law and the equal protection of the laws, and that in their corporate capacity, as artificial persons. they were entitled to the same protection. Not until the lapse of 18 years after the adoption of the amendment were these artificial persons clearly held to be within the purview of its first section. This was in 1886, in Santa Clara County v. Southern Pacific Railroad. Since that time, of the cases involving the construction of this amendment, those in which corporations are interested probably outnumber all others combined. The courts have quite clearly distinguished, however, one important difference between these artificial persons and citizens. Privileges and immunities are held to belong only to the latter. Corporations must rely for their protection under the 14th Amendment upon their character as persons.

The Civil Rights Cases furnish the most striking instance of the difference between the interpretation placed upon the 14th Amendment by those who framed it, and that of the court whose province it is to construe its meaning and determine its powers and limitations. These cases, which were decided in 1883, arose through certain alleged violations of the first and second sections of the Civil Rights Act of 1875. It will be recalled that this act declared all persons entitled to the equal accommodations of hotels, theatres and public conveyances. It also provided certain penalties for the denial of these privileges "to any citizens, except for reasons by law applicable to citizens of any race and color." The court held that these two sections of the act were unconstitutional and void. They were held to be "direct and primary, as distinguished from corrective, legislation," and as such constituted an invasion of the domain of

State control of its purely domestic affairs. The court placed upon the amendment the important and far-reaching construction that it operated as an inhibition upon the States alone, and not upon their citizens. In the words of Mr. Justice Bradley: "Civil rights, such as are guaranteed by the Constitution against State aggression, cannot be impaired by the wrongful acts of individuals unsupported by State authority." Two other important interpretations of the 14th Amendment are that "equal" does not necessarily mean "identical," as applied to rights and privileges, and that the amendment created no new "privileges or immunities." Under the former have been upheld State laws which provided separate schools for the two races, and also those requiring railroads to provide "separate but equal" accommodations. Under the latter of these interpretations the court has held that women, as citizens of the United States, have no privileges to which citizens were not entitled before the amendment. Hence a State statute prohibiting women from voting or practising law was not an abridgment of the privileges of citizens within the purview of the amendment. If considered from the narrow viewpoint of a mere attempt to endow one race with privileges and immunities enjoyed by another, the interpretation of the 14th Amendment has fallen short of the hopes and expectations of many of its advocates. The first section is now all of real significance that remains of the amendment. Held within its proper bounds, and wisely interpreted as it has been, this wears no longer the aspect of an instrument in derogation of the dignity of the States. As an effort to render more secure to all persons life, liberty and property, it stands forth in some measure worthy of rank with the 10 great amendments which constitute the American Bill of Rights.

Of the 15th Amendment it may be said as Mr. Justice Miller said of the 13th: "Its two short sections seem hardly to admit of construction." Of itself it confers suffrage upon no one. Save upon the grounds of race, color and previous condition of servitude, it does not diminish the right of the State to regulate the suffrage of its citizens. The power to impose any other qualification remains as it was before 1870. This has been held clearly enough in the few cases involving the right of suffrage abridgment thus far presented to the court. For one section of the country at least, harassed by problems peculiar to itself, it is well that this is so. See CONSTITUTION OF THE UNITED STATES; also CONSTITUTIONAL AMENDMENTS.

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39. THE WAR WITH SPAIN. The Spanish-American War of 1898 was the outcome of conditions set up in Cuba by the political discontent in the island during nearly the whole of the 19th century, varied in the latter half by long-continued revolts. The United States government, controlled as it was in the earlier half of the century by the slave interest of the South, had desired and made overtures at intervals to annex the island. But this wish disappeared with the changed conditions brought by the Civil War. There was no longer a reason through desire to extend slave territory, and the annexation of a large alien population, much of which was colored, was repellant. The Ten Years' War in Cuba, which began in 1868 through the refusal of Spain to accede to plainly necessary reforms, had been ended by promises from Spain which were not kept. Revolt thenceforward was passive rather than active, but sure in time to break into activity, which it did in 1895. The commercial and social conditions begotten by chronic strife through so many years wrought not only upon the sympathies of the United States, but generated ill feeling which must always come when trade interests are deeply injured. Large property interests in the island itself were held by Americans, many of whom suffered most severely. By the end of 1897 the island had been brought to the verge of ruin. The insurgents, always strong in the east, had raided the west, burning canefields and destroying plantation buildings in the attempt to create a desolation which would make Cuba valueless to Spain. The Peninsular Government with more than 200,000 men in the island was making no headway against the insurgents. It had become clear, as Consul-General Lee reported to his government, that Spain was powerless to suppress the revolt, and the insurgents equally powerless against the Spanish occupation. A large proportion of the rural population had been brought within the Spanish lines by a decree of Governor-General Weyler, issued early in 1897. But the Spanish authorities could feed neither them nor their own troops. Destitution, starvation and death to an appalling degree was the result; cultivation outside the Spanish lines practically ceased; the commonest necessaries of life had to be imported. Spain looked upon the situation as due largely to American sympathies and aid. No doubt the dogged persistence of the insurgents was due in a considerable degree to hopes of American intervention, but the fact is that the American government loyally did its duty in suppressing unlawful attempts to send aid from its territory. It could not suppress the general sentiment of the country for a much-suffering population. The American government thus felt called upon to insist upon reforms which would restore something like the normal conditions of human society, and this pressure, united with the action of the Spanish liberals, caused to be enacted the law signed by the queen regent, November 1897, establishing a system of Cuban autonomy. General Blanco was sent in the beginning of 1898 as governor-general with the avowed object of pacification upon such lines. But the Spaniards and their friends in Cuba were opposed to the scheme as granting too much; the insurgents, as granting too little. Nor were the latter willing to continue the dominancy of Spain at any price. Nothing short of independence would be listened to. The attempt was thus doomed to failure. January 1898 was marked by serious military riots in Havana due to the opposition of the Spanish party to Blanco. In consequence of the supposed danger from

these disturbances to American citizens, the *Maine,* which had been for some time at Key West and vicinity, engaged in looking after filibustering attempts, was sent to Havana. Her arrival caused offense. She dominated the city from her anchorage, and her coming was thus looked upon as a threat. Her destruction, 15 February, naturally laid by the American public at the door of the Spaniards, brought a state of excitement which, combined with the previous feeling, made war dangerously near. The Court of Inquiry of which Admiral (then Captain) Sampson was president, after sitting more than a month, rendered a finding that her destruction was due to an exterior mine. This finding was chiefly based upon the extraordinary manner in which the keel was forced up at the centre of the explosive effort, 34 feet above its normal position. As the ship settled but from four to six feet before touching bottom, it would seem impossible that any launching forward of the after body could have produced such an effect. Two other considerations add weight to the board's finding; the first, that the only ship of the American navy ever so destroyed had to wait to arrive in an unfriendly port before the catastrophe should be accomplished; the second, the wholly different effects of the explosion of the forward magazine of the *Oquendo* after the Santiago action. The finding of the board in no way implicated the Spanish government, and the writer, as a member of the board, can state explicitly that no member of the board held such a view. It should be added that the very cursory and untrustworthy examination by the Spanish divers is shown by their report that the keel appeared to be intact. The examination made in 1911 by the army and navy board, after the uncovering of the wreck, substantiated the finding of the Court of Inquiry.

Events thenceforward marched rapidly. Congress and the people of the United States both became very hostile in sentiment to Spain. As early as January the government had taken steps to cover eventualities, as far as the navy was concerned, by ordering that the time expired men should be retained, and after the *Maine* disaster ships were concentrated; the North Atlantic squadron at Key West, the Asiatic squadron at Hongkong (ordered 25 February). Congress 9 March voted $50,000,000 for national defense; merchant vessels and yachts were purchased and armed; colliers and two hospital ships equipped; the four large ships of the American Line taken over for service and the two cruisers built at Elswick for Brazil, purchased and renamed the *New Orleans* and *Albany;* the latter, however, was not far enough advanced to be used during the war. An American merchant ship which had been converted into a cruiser by Brazil was also bought, as also the *Diogenes* of 1,800 tons, built for Peru and never delivered, renamed *Topeka*; a small torpedo boat purchased in Germany and named the *Somers,* which did not reach the United States until after the war. The Treasury Department turned over to the navy 15 revenue cutters and four lighthouse tenders, all of which did good service. Coal in quantities was forwarded to Key West, which rapidly assumed the prominence of an important naval base, the command of which was assigned to Commodore Remey. A squadron was formed at Hampton Roads of the *Brooklyn* (flag) and battleships *Massachusetts* and *Texas,* denominated the flying squadron with Commodore W. S. Schley in command.

The two navies stood as follows:

	United States		Spain	
	Nominal	Effective	Nominal	Effective
Battleships	*5	5	1	0
Armored cruisers	2	2	6	4
Monitors	6	6	†2	0
Protected cruisers	13	8	5	4
Unprotected cruisers and gunboats	21	20	9	5
Torpedo gun vessels	1	1	11	10
Torpedo boat destroyers	0	0	6	6
Torpedo boats	6	6	12	3
Small gunboats	0	0	‡84	?

* One second-class.
† Old iron-clads done over — non-effective.
‡ All but 20 of these last under 200 tons.

The war was necessarily to be mainly naval. Whoever should control the sea would win. Spain could only hold Cuba by being able to send thither troops and supplies. As Mahan well says: "A million of the best soldiers would have been powerless in face of hostile control of the sea." The United States could not invade Cuba unless the navy was strong enough to control the neighboring waters and make transport to and fro perfectly safe. Spain had, in the squadron under Rear-Admiral Cervera, four fine armored ships of 20-knot speed and good armament, with which in speed and armament the United States had but two to cope, the *New York* and *Brooklyn*. So long as this squadron existed, Spain had a powerful military asset which would aid the war's continuance. The *Carlos V* of like character was also counted, even by the Spanish Minister of Marine, as available, as also the *Pelayo,* a second-class battleship, overhauling at La Seyne (near Toulon) where she had been built. In the East were two squadrons, facing one another, but neither was of a character to play a decisive part in such a war; neither could face a squadron of armored ships without expecting destruction. The disquieting element to the United States was thus Cervera's squadron which it was expected at the time would be increased by at least the two other armored ships mentioned; and it was a reasonable disquiet. It was very possible for this squadron to have appeared upon the United States coast, causing much apprehension and some damage and to have taken refuge in Havana, to emerge again under the guns of what became, as time went on, powerful batteries. But as we know from Admiral Cervera's reports, the inefficiency of his ships made such action hopeless. Spain had started a small torpedo flotilla to Cuba in early March, but the sea was too rough for the smaller boats and all took refuge at the Cape Verdes, returning later, except the three torpedo boat destroyers, to Spain. The *Viscaya* had been sent to New York in February as an offset to the visit of the *Maine* to Havana, whither she shortly went. She was joined there by her sister ship, the *Oquendo,* the arrival of the two adding greatly to the enthusiasm of the Spanish party. But this action was ill-

considered. Neither ship had been docked for many months and when they left 1 April to go to the rendezvous east of Porto Rico to meet the expected torpedo flotilla and, failing the rendezvous, had to go to the Cape Verdes to join Cervera, they had crossed the Atlantic twice, had severely tried their engines and boilers, and had had no chance for a much needed overhauling of their machinery. They thus started on a third transatlantic journey, bottoms foul, machinery in bad condition and ill equipped in almost every respect except in gallant spirit, to meet a foe who was in the highest state of preparation. The advice and prophecies of Cervera were unheeded. When war had declared itself a large number of officers high in the navy met at Madrid 24 April and decided that his squadron should at once proceed to San Juan, Porto Rico, its later movements being left to his discretion. The decision revealed an utter lack of preconceived plan and ignorance of the conditions of the problem. The ultimatum signed by President McKinley 20 April 1898, demanding the withdrawal of Spain from Cuba, was practically a declaration of war and the Spanish government sent the American Minister his passport the next day without awaiting the presentation by him of the fateful resolution.

In the early morning of 22 April, Captain Sampson, then rear-admiral by the authority vested in the President in time of war, sailed with such of the ships as could be made ready to leave, with orders to blockade the Cuban ports. The ships at or near Key West which could be drawn upon for this first move were (armored) *New York, Indiana, Iowa*; (monitors) *Puritan, Terror, Amphitrite*; (cruisers) *Cincinnati, Marblehead, Detroit;* (cruiser-gunboats) *Wilmington, Machias, Castine, Nashville, Newport, Helena, Dolphin* and auxiliary *Mayflower*; (torpedo boats) *Dupont, Porter, Foote, Winslow, Cushing* and *Ericsson*; (armed tugs) *Nezinscot, Samoset,* the armed lighthouse tender *Mangrove* and supply steamer *Fern.* By the afternoon of 23 May 20 of these were on the blockade, which was established from Cardenas, 85 miles east of Havana to Bahia Honda, 55 miles west. It had been Sampson's wish to attack Havana at once and the order of battle was prepared, but the Navy Department refused consent, holding that the heavy ships should not be risked against batteries until the Spanish squadron should be met. This was undoubtedly correct in principle, but Sampson's knowledge of the conditions was more complete than that of the officials in Washington. Had Sampson had his way he would have taken Havana at once, without loss or serious injury to his fleet. It is an extraordinary fact that the disposition of the batteries was such that beginning at the southwest there was but one six-inch gun which could reply in that direction. The batteries could have been enfiladed, one by one without any return fire whatever. Sampson's plan of attack, though more frontal, would in the writer's opinion have been perfectly successful. He could, after silencing the batteries, have anchored in the bight west of the Morro and awaited the coming of an army of occupation as did Dewey at Manila. It was his intention to go within 800 yards of the batteries, the water being extremely deep to the shore itself; it would have been impossible for the men in the batteries, exposed as they were, to stand to their guns under the fire of the multitude of small guns carried by the small ships. Sampson yielded to the department's views with great reluctance. Commodore Dewey, who had relieved Rear-Admiral McNair in command of the Asiatic station, had concentrated, by order of the department of 25 February, all the ships of his squadron at Hongkong.

His squadron was composed of the following:

	Tons	Speed	Main armament
Oympia	5,870	21.6	4–8″; 10–5″
Baltimore	4,413	20.	6–6″
Raleigh	3,183	19.	1–6″; 10–5″
Boston	3,000	15.5	2–8″; 6–6″
Concord	1,710	17.3	6–6″
Petrel	892	13.7	4–6″

The ships carried also 36 six- and three-pounders, 40 smaller guns and 19 torpedo tubes; the crews numbered 1,743 men. The revenue cutter *McCulloch,* lately arrived, had been joined to the squadron, but was lightly armed, and could not be considered as adding to his fighting force. At Manila, under Rear-Admiral Montojo, these ships were available for action:

	Tons	Speed	Main armament
Reina Cristina	3,090	16.0	6–6.2″
Castilla	3,342	0.	4–5.9″ 2–4.7″
Don Antonio de Ulloa	1,152	14.	*2–4.7″
Don Juan de Austria	1,152	14.	4–4.7″
Isla de Cuba	1,040	15.9	6–4.7″
Isla de Luzon	1,040	15.9	6–4.7″
Marques del Duero	500	10.	2–4.7″

* This ship's machinery was under repair and the other two guns of her main battery were mounted, one at El Fraile, the other at Saugley Point.

Two 2.9-inch, two 2.7-inch, 27 six- and three-pounders, 19 smaller guns and 17 torpedo tubes, with crews amounting to 1,695 men, were carried by the ships just mentioned. Besides there were the *Velasco* of 1,139 tons with two of her four guns at El Fraile and two gunboats, the *Correo* and *General Lezo* of 525 tons and three 4.7-inch guns each. All these were under repairs and took no part in the coming action, the crew of the *Velasco* manning the hastily built batteries at the entrance of the bay 25 miles from Manila. The *Castilla,* a wooden ship, built in 1881, had to be towed, as she could not use her engines. It must be admitted that the Spanish outlook was a sorry one and fully as hopeless as the report of Admiral Montojo indicates it to have been in his own mind.

The *Baltimore* had arrived at Hongkong 22 April and was allowed by the Hongkong authorities to be docked. On the 25th the British governor requested Dewey to leave and the squadron went to Mirs Bay, 30 miles distant on the China Coast, where it awaited the arrival of O. F. Williams, the American consul to Manila, whose local knowledge was regarded valuable. He came 27 April and that afternoon the squadron left in accordance with the Navy Department's telegram, sent 24 April, announcing that war had begun and directing Dewey to "commence operations at once,

particularly against the Spanish fleet. You must capture vessels or destroy." The telegram ended "Use utmost endeavors," words which might have been spared. On the same day that the American squadron went to Mirs Bay, Montojo left with the *Reina Cristina, Castilla, Don Juan de Austria, Isla de Cuba, Isla de Luzon* and the *Marques del Duero* for Subig Bay, an excellent defensive point 50 miles distant from Manila, and one where batteries had been begun by Spanish army engineers. The bay was the site of a proposed new Spanish naval arsenal, some buildings for which had already been erected. Montojo towed the *Castilla.* Three vessels had been sunk in the eastern entrance to Subig Bay and it had been hoped to hold the western with the batteries and ships. But the batteries were not ready. The failure of the admiral to have this knowledge beforehand was in itself a startling instance of the inefficiency of Spanish administration. Receiving a telegram 28 April that Dewey had left for Manila, Montojo held a council and returned, mooring in a general east and west line in Cañacao Bay, just north of the spit on which was the small naval arsenal and village of Cavite and abreast the small batteries mounting, on the sea front 4.7-inch B. L.; on Sangley Point two 5.87-inch B. L.; at Cavite three 6.2-inch muzzle-loading rifles. At and near Manila were 36 guns; none of these were of great range and most were ineffective. There were, however, four 9.45-inch breech loaders and eight of 4.2-inch and 5.87-inch converted to breech loaders, which might have aided Montojo's defense had he lain close in shore off the city.

Dewey arrived off Subig the afternoon of 30 April, reconnoitered Subig with three of his ships and informed his captains assembled in consultation of his intention (the Spanish ships not being found in Subig) to stand on slowly and arrive at Manila at daybreak. He stood for the Boca Grande. The mouth of the bay, which is half way between Subig and Manila, is 10 nautical miles broad and divided by the island Corregidor two miles from the mainland on the north, which thus forms the Boca Chica (narrow mouth). On the north side of this entrance were two batteries; one (Punta Gorda) mounted 7-inch muzzle loading rifles, the lower, two 6.2-inch B. L. Hontoria rifles. On Corregidor itself were three 7-inch muzzle loaders looking north. Two miles southeast of Corregidor is Caballo island on which were three 5.87-inch B. L. Armstrong rifles. Three and a half miles from Caballo is El Fraile, on which was a battery of three naval 4.7-inch guns taken, two from the *General Lexo,* one from the *Don Antonio de Ulloa.* All these batteries were built and manned by the navy. There were no torpedoes, the channel being too broad and deep for mining. The squadron naturally selected the broad passage between El Fraile and Caballo, which was reached at midnight. Signals from Corregidor showed that they were discovered and two shots were fired from El Fraile which were answered by three of the ships, and the squadron headed at slow speed for Manila, 25 miles distant. At 5.15 it was fired at from the Manila and Cavite batteries as it approached; the Spanish ships being sighted to the southward, the American squadron turned south and opened fire at 5.41. The ships moved in column three times west and two east, about parallel to the Spanish line and at ranges varying from 5,000 to 2,000 yards. At 7 the Spanish flagship made a futile effort to leave the line and attack, and at 7.35, it being erroneously reported that but 15 rounds per gun remained for the 5-inch battery, the American squadron hauled off and the commanding officers called aboard the flagship for consultation. The crews were given breakfast. Nothing was known at the moment of the effect of the attack, but somewhat later this was evident when the two largest Spanish ships were seen to be afire. Being assured as to the ammunition supply, the attack was renewed at 11.16 and continued until 12.40 when the American squadron returned and anchored off Manila. The *Reina Cristina, Castilla* and *Don Antonio de Ulloa* had sunk; all the others were burned by a party sent in from the *Petrel* after resistance had ceased and the ships been abandoned. The Spanish loss was 167 killed and 214 wounded; there were of the Americans 7 slightly wounded. While the American squadron was more powerful, the difference in character of ships and numbers of types of guns cannot account for this immunity from loss on the American side. All the ships were vulnerable to all but the very lightest of the Spanish guns. The only reasonable supposition is that the Spanish by want of practice and through temperamental excitability could not shoot with any accuracy whatever. There was courage in abundance, but no training.

Dewey made no effort to capture the city of Manila, as he had no troops to hold it. No further firing took place. Cavite arsenal was taken possession of and a blockade of Manila established. He lifted and cut the telegraph cable, but the Hongkong office of the cable company refused to take his messages as vitiating its contract with the Spanish government. It was thus necessary to send a ship to Hongkong to cable thence. The *McCulloch* coaled and left 5 May, and arrived at Hongkong the 7th with the official information of the victory. There was a period of quiet waiting for the troops and ships, varied with rumors of the despatch of a fleet from Spain and by the arrival of Aguinaldo and the organization of a Filipino army which was later to give much trouble. The first American troops, 2,500 in number, reached Luzon 30 June accompanied by the cruiser *Charleston,* which took over the surrender of Guam en route; the second expedition of 3,500 arrived 16 July. Dewey in the meantime was rendered anxious by the departure from Cadiz 16 June of the Spanish squadron under Admiral Camara. This consisted of the second-class battleship *Pelayo,* the armored cruiser *Carlos V,* three destroyers, three armed liners (two of which had been purchased from the Hamburg Line) and four transports. The expedition was in reality as ill advised as any other act of the Spanish Ministry of Marine. There were but two ships of any power and one of these slow; the rest, excepting the destroyers, were powerless for offense or defense. The battle of Santiago, which left Spain's coast open to the attack of the squadron which was formed to go through the Mediterranean, settled the question of their return, which was ordered from Spain 7 July. An expenditure of $320,000 for the benefit of the canal company was the main result of the expedition. In any case the arrival of the *Monterey* 4 August and the *Monadnock* 16

August, very effective ships in smooth water, removed any anxiety on the part of the American commander. While much was to come in the Philippines, the battle of 1 May practically determined that they were lost to Spain unless she should succeed in destroying the American fleet in the Atlantic; should she do this the question of final command in Asian waters could easily wait. The loss of the Philippines could have no determining effect (valuable as the result was in prestige and in setting to rest any question of a European concert of intervention) so long as Spain could keep open her communications with Cuba, relinquishment of Spanish authority in which had been announced in the Congressional resolution of 20 April as the object of American action. In the Atlantic was her only battle squadron; so long as this was in being, so long would the war continue.

Cervera left the Cape Verdes with his four armored cruisers and three destroyers 29 April. This was known at the Navy Department the same day and the news at once transmitted to Sampson. The latter determined to go eastward with the main part of the battle portion of his fleet. He obtained the consent of the department, coaled his ships and 4 May left with the *New York, Iowa* and *Indiana,* the monitors *Amphitrite* and *Terror,* the cruisers *Montgomery* and *Detroit,* torpedo boat *Porter,* tug *Wompatuck* and collier *Niagara.* He had calculated to reach San Juan by the 8th, judging that by this date the Spanish squadron would be in that longitude and premising with his usual excellent judgment that San Juan was their objective, as was the case. Should he not find them at San Juan it was his intention to at once return to Havana, after making an effort to occupy San Juan and leaving the monitors there in occupancy, to hold it against the Spanish squadron should it appear later. Continuous breakdowns of the monitors, which had to be towed a great part of the way, and of the *Indiana,* so delayed the squadron that it was not off San Juan until the early morning of 12 May. No Spanish ships were there. The fortifications were, however, assailed by the squadron in an active bombardment of three hours, in which, on the American side, one man was killed and four wounded. On the Spanish side eight were killed and 20 wounded. There is little doubt, as is known from Spanish officers present, that the place would have been yielded had the attack been a little longer continued, not through actual damage but through pressure from a population frantic with fear. Sampson, however, yielded to the arguments regarding the necessity of holding the fighting ships intact to meet the Spanish fleet, and started westward.

The day previous to that of the action at San Juan occurred, as far as loss of life was concerned, two of the most serious fights of the war; one in connection with the cable cutting at Cienfuegos, the other at Cardenas; both were most gallant deeds. The four launches (including two steamers) of the *Marblehead* and *Nashville,* under the immediate charge of Lieutenant Winslow, were employed in the former operation, which was carried on in the early morning within a few yards of the beach under a covering fire from the ships in a rough sea and under a severe rifle fire from shore. Three hours were spent in lifting the cables, two of which were cut; a third was lifted but as it was thought to be a small cable connecting the destroyed cables with Cienfuegos and thus useless, it was left uncut, it being thought advisable not to delay for the purpose under the heavy and increasing fire. Lieutenant Cameron McR. Winslow and 12 men were wounded, two of the men mortally. At Cardenas, which was blockaded by the *Machias, Wilmington,* the revenue cutter *Hudson* and the torpedo boat *Winslow,* it was determined to attack the three Spanish gunboats in the port, which is extremely shallow and difficult of access to larger vessels. The *Winslow,* leading, had approached the town within a mile when fire was opened by the Spanish battery and gunboats. Though supported by the other ships, the *Winslow* armed only with three one-pounder guns could not make much return. The Spanish fire was concentrated upon her, her steering gear and one engine injured and a shell exploded in one of her boilers. She became helpless and drifted shoreward. The *Hudson,* the lightest of the three other vessels, gallantly went to her aid and towed her into safety, but not before the *Winslow's* commander, Lieutenant Bernadou, had been wounded, and a little later, Ensign Bagley and two seamen killed and two others mortally wounded by a shell which exploded on the deck. Her use for such a purpose was, of course, not justified, and the same might be said of much of the employment of these frail crafts during the war, the paucity of vessels and the necessities of the service making such misapplication unavoidable.

Sampson standing westward with his slow squadron received the first news of Cervera's arrival in the Caribbean at 3.30 A.M. 15 May while off Porto Plata, San Domingo. He then learned that Cervera was on the 14th off Curacao, and that the destroyer *Terror* was at Martinique. The telegram announcing this directed him to proceed with all possible dispatch to Key West, whither Commodore Schley's squadron was also ordered from Hampton Roads. Cervera's slowness of movement had been a surprise to all concerned on the American side at least. The two large liners *Harvard* and *Saint Louis* had been dispatched, on his departure from the Cape Verdes, to cruise on a line 73 miles north and south about 100 miles east of Martinique, until noon of 10 May. Had the orders read until 11 May, they would in all probability have sighted the Spanish squadron at sea. As it was the *Harvard* reached Saint Pierre, Martinique, at 9 A.M. of the 11th and the destroyer *Furor,* Fort de France, the capital of the island, at 5 P.M. The news reached the Navy Department early 12 May by telegram from Captain Cotton of the *Harvard.* The broken-down destroyer *Terror* came into Fort de France next morning and remained there until 25 May when she went to San Juan, where she will be later heard from. The presence of Sampson at San Juan changed Cervera's course. Had the American squadron been slower by two or three days in reaching San Juan, Sampson's surmise would have proved correct. He would have found and destroyed the Spanish ships there, where they were ordered to go, instead of at Santiago. Cervera's information regarding Sampson's movements caused him to shape his course from Curaçao, 290 miles away, in hope of obtaining much needed coal, and picking up the vagrant colliers *Roath, Twickenham* and *Restormel,* which had been chartered by Spain. These, however, failed him, but the

Curaçao authorities allowed him 500 tons for the *Teresa* and *Vizcaya*, and he was enabled to obtain fresh provisions. At 5.15 P.M. 15 May he left for Santiago de Cuba. The *Saint Louis* which had joined Sampson the morning of 15 May was ordered with the armed tug *Wompatuck* to Santiago to cut cables, and left the squadron for that port almost at the same hour as Cervera. Captain Goodrich, commanding the expedition, succeeded 18 May in cutting one cable in over 500 fathoms of water, engaging the batteries at the same time. Having succeeded, as he supposed (mistakenly), in destroying the Santiago-Jamaica connection, he left for Guantanamo for the purpose of destroying the French cable leading from there, but an engagement of 40 minutes with the Spanish gunboat *Sandoval* compelled him to desist, the very vulnerable character of his own ship, wholly unfitted for fighting, rendering this necessary. At this time, 8 A.M., 19 May, Cervera was entering Santiago Harbor only 40 miles away, having taken three and a half days to traverse the 600 miles from Curaçao. Sampson reached Key West at 4 P.M. of the 18th and found Commodore Schley's squadron, which had arrived at midnight. All but the smallest vessel off Cienfuegos were ordered by the Navy Department to be withdrawn. The telegrams received showed that the Washington authorities were convinced by information received that the Spanish squadron was supposed to carry munitions of war essential to the defense of Havana, and that it must reach this port or one connected by rail with it, notably Cienfuegos. The flying squadron was thus, with such additional armored and other vessels as Sampson should judge suitable, to proceed to Cienfuegos, Havana, being covered by the remainder of the fleet. Sampson was to have choice of command off Cienfuegos or Havana; Schley, however, to keep the flying squadron. He generously gave the opportunity to Schley, who having coaled, sailed on the forenoon of the 19th with the *Brooklyn, Massachusetts, Texas* and *Scorpion* with orders to establish a blockade at Cienfuegos with the least possible delay. Shortly after leaving Key West he passed the *Marblehead* and *Eagle* returning from Cienfuegos, Commander McCalla of the *Marblehead* having withdrawn the whole force on his own responsibility. McCalla communicated the situation there by sending the *Eagle* to speak the *Scorpion*. Much was made of his failure to mention an arrangement of signals he had made with the considerable Cuban force west of the harbor in case these latter wished to communicate, but as will be seen later this was of no consequence. The *Iowa*, the collier *Merrimac*, the *Castine* and the torpedo boat *Dupont* left on the forenoon of the 20th to join Commodore Schley, thus making a force much more than able to meet the Spanish squadron. A telegram was received from the Navy Department at 12.30 A. M. of this day saying, "The report of the Spanish fleet at Santiago de Cuba might very well be correct; so the department strongly advises that you send immediately by the *Iowa* to Schley to proceed off Santiago with his whole command, leaving one small vessel off Cienfuegos . . ." The peculiar phraseology of the telegram, taken in connection with the Navy Department's insistence upon the necessity of Cervera's coming within reach of Havana, caused doubt in Sampson's mind, and he thus determined to hold the *status quo* until further information should be obtained. He thus wrote Commodore Schley to that effect, sending a personal letter and an official dispatch by the *Iowa* and a duplicate by the *Dupont*, which vessels also carried copies of a memorandum prepared by Commander McCalla regarding the Cuban forces west of Cienfuegos which showed that he had communicated with them, and mentioning a convenient landing place some 13 miles from the port. Corroboration of Cervera's arrival coming the evening of the 20th through the Key West cable office from an employee in Havana who had also sent the first, a dispatch was prepared to go by the *Marblehead*, supposed ready to leave for Cienfuegos, saying, "Spanish squadron probably at Santiago de Cuba — four ships and three torpedo boat destroyers. If you are satisfied that they are not at Cienfuegos, proceed with all dispatch, but cautiously, to Santiago de Cuba, and if the enemy is there, blockade him in port. . . ." As it appeared during the night that the *Marblehead* might be delayed, Sampson upon arrival off Havana in the afternoon (21 May) sent the *Hawk* as the fastest of the squadron with a copy of the dispatch, and an additional memorandum, the tenor of which urged the utmost dispatch as did also the verbal instructions which Lieutenant Hood of the *Hawk* was ordered to communicate. Sampson moved with the available force on the north side of Cuba to Nicolas Channel, in order to have an advanced position in case Cervera should move toward Havana from the east. Hood arrived off Cienfuegos at 7.30 A.M. 23 May, delivered his dispatches and repeated the verbal instructions. He returned the same day, reaching Havana 25 May with dispatches from Schley which reached Sampson at 9.30 P.M. of the 26th by the *Dolphin*, whose failure to pick up the squadron earlier was a startling instance of the difficulty of finding even a large force at sea. Schley wrote that he was by no means satisfied that the Spanish squadron was not at Cienfuegos, giving a number of reasons for his belief, one of which was his having heard guns the afternoon of 21 May (when about 40 miles from Cienfuegos), which he took to be a welcome to the Spanish fleet. Lights, which turned out to be signals by the Cubans as arranged with Commander McCalla, had been seen to the westward of the harbor, but this arrangement, not having been communicated to Commodore Schley, was not acted upon, though the fact of the presence of Cuban troops in that vicinity was known from the memorandum previously mentioned. The report of Captain Dayton of 20 July when blockading Cienfuegos would seem to show that it was not necessary to apply to the Cubans for knowledge regarding ships in the harbor. Dayton says (p. 219 Appendix to Report of Chief of Bureau of Navigation 1898): "During the afternoon I made as close an inspection [of Cienfuegos Harbor] as practicable. From aloft could detect in the inner harbor four large steamers flying Spanish colors, one with four masts and one smoke stack, one with three masts and one smoke stack, and two with two masts and one smoke stack; also two fair-sized gunboats, the larger being apparently of the *Esmeralda* class. . . . The four-masted steamer was

surrounded by lighters and appeared to be discharging cargo."

The arrival of Commander McCalla, however (with the *Marblehead*, 24 May), who at once found the Cubans at the point which had been designated in his memorandum settled the fact that Cervera was not at Cienfuegos. Commodore Schley thus left that evening with his squadron making, however, such slow progress that he was not off Santiago, 315 miles from Cienfuegos, until the afternoon of 26 May. The *Yale, Saint Paul* and *Minneapolis* were at the moment off Santiago by orders of the Navy Department to watch the port, and on the morning of 25 May the *Saint Paul* had captured the British collier *Restormel* with 2,400 tons of coal which had already touched at Porto Rico and Curaçao from which latter place she had been ordered to Santiago. The *Harvard* which had also been there had gone to Saint Nicolas Mole to send a dispatch received by the *Scorpion* 24 May from Commodore Schley. The three other ships, sighting the smoke of a number of ships to the south, had steamed in that direction, thus leaving the port without any observing ship, a fact which as will appear later might have had most serious consequences. It was found that Commodore Schley had determined to return to Key West and at 7.45 P.M., signal being made to that effect, the squadron headed westward with the collier *Merrimac* in tow of the *Yale*. The frequent breaking of the towline caused little progress to be made. The *Harvard* on the morning of 27 May reached the squadron and delivered a telegram received from the Navy Department at Saint Nicolas Mole the preceding morning (26 May), the more important part of which was that directing him to proceed at once and inform Schley and also the senior officer present off Santiago de Cuba as follows: "All Department's information indicates the Spanish division is still at Santiago de Cuba. The Department looks to you to ascertain fact and that the enemy, if therein, does not leave without a decisive action. . . ." This was answered (sending the *Harvard* to Kingston for this purpose and for coal) in a telegram, the main parts of which are as follows: ". . . *Merrimac's* engine is disabled and she is helpless; am obliged to have her towed to Key West. Have been absolutely unable to coal the *Texas, Marblehead, Vixen* and *Brooklyn* from collier owing to very rough seas and boisterous weather since leaving Key West. *Brooklyn* is the only one in squadron having more than sufficient coal to reach Key West. Impossible to remain off Santiago in present state of coal account of squadron. . . . It is to be regretted that the Department's orders cannot be obeyed, earnestly as we have all striven to that end. I am forced to return to Key West via Yucatan passage for coal. Can ascertain nothing certain concerning enemy. . . ." This was a very unhappy telegram in view of the facts that the *Iowa, Massachusetts, Castine* and *Dupont* had coaled from the collier at various times and that the *Texas* and *Marblehead* took coal the evening of the day the dispatch was sent; that while it was but 790 miles to Key West, the *Massachusetts* had sufficient coal to steam, at 10 knots, 2,371 miles; the *Iowa*, 2,028; the *Texas*, 1,459. The *Brooklyn* had enough to have blockaded 32 days; the *Massachusetts*, 24; the *Iowa*, 18; the *Texas*, 14, and the *Marblehead* about 6 days and still have enough to go to Gonalves Bay in Hayti (Testimony Schley Court of Inquiry, p. 535). There was, moreover, the splendid and commodious harbor of Guantanamo but 40 miles east of Santiago, to be had, so to speak, for the asking. Had the squadron gone to Key West, it would still have had to coal at an anchorage in the open sea. Nor was any real endeavor made to get information as to the presence of the Spanish squadron. Most fortunately the next day, 28 May, Commodore Schley, now 38 miles west of Santiago, decided to return and go off the port. He arrived there the same evening and the question of the presence of the Spanish squadron was fixed by discovering the *Colon* moored near the harbor entrance; and another man-of-war and two destroyers near her. Cervera had been twice on the point of leaving Santiago for San Juan, Porto Rico, and steam was actually got up on the evening of 26 May, and every preparation made to leave, when his heart failed him at the report that the swell was sufficient to cause danger of the *Colon's* striking a rock off Point Morillo on which there was but two and one-half feet of water more than the *Colon* drew. With the American squadron so far (20 miles at 8 P.M.) to the south and with the intended departure so near nightfall, it is very probable the Spanish squadron would have got away unnoticed. There is no need to dwell upon the sensation such an escape would have made.

Schley's telegram of 27 May produced consternation at Washington. Sampson on the north side of Cuba had occupied Nicolas Channel 25 May. The force in the beginning was a very meagre one, the *New York* and *Indiana* being the only armored ships; with these were the gunboats, *Newport, Vicksburg, Mayflower, Machias*, and the torpedo boats *Rodgers* and *Foote*. If the Spanish squadron should be met it was expected that the gunboats should be sacrificed in the general attack. In the afternoon of the same day, however, the fast and excellently armed cruiser *New Orleans* joined, and by the 25th were added the *Montgomery* (with the broad pennant of Commodore Watson), the *Cincinnati, Detroit, Miantonomoh, Puritan, Terror, Amphitrite, Wilmington, Wasp* and *Vesuvius*; a powerful force if the Spanish squadron would only wait an attack, but amounting to little if it should use its speed to escape. This heterogeneous collection of ships was fitly called by the men the "Bargain Counter" squadron. The dispatches brought by the *Dolphin* in the night of 26 May, announcing that Commodore Schley had not moved from Cienfuegos, caused the *Wasp* to be dispatched to him with an order to proceed "with all possible dispatch to Santiago to blockade that port. If on arrival there you receive positive information of the Spanish ships having left, you will follow them in pursuit." This, of course, was not delivered, the *Wasp* having found that Commodore Schley had already gone. Sampson supposed this might be the case, as appears in his telegram of 27 May to Washington, and his supposition was confirmed by a telegram sent by the torpedo boat *Dupont* 24 May by Commodore Schley to Key West for transmission to Washington, in which he mentioned that he would "move eastward tomorrow" (25th), though in fact he left

that night. The mention of this delay, however, decided Sampson to go himself to Santiago. The *New Orleans* was ordered there with the collier *Stirling*, and her commander, Captain Folger, was ordered to communicate with Schley "and direct him to remain on the blockade of Santiago at all hazards, assuming that the Spanish vessels are in that port." He also carried directions to use the *Merrimac* to block the harbor entrance, a suggestion for doing so also coming from the Navy Department. Though somewhat criticised, this was wise from the point of view at the time. The telegram of the Secretary of the Navy of 5 May directed Sampson not to so risk his ships against fortifications "as to prevent from soon afterward successfully fighting the Spanish fleet composed of the *Pelayo, Colon, Teresa* and four torpedo boat destroyers if they should appear on this side." Spanish reinforcements were thus regarded possible; there were two destroyers in Santiago and the danger to ships on blockade of being torpedoed would be constant; to hermetically seal a powerful squadron in the port, the entrance channel to which was less in breadth than the length of a ship of moderate size, thus leaving our own force free for other operations, was sound policy and so held by every one consulted.

Sampson arrived at Key West at 2 A.M. 28 May and found the *Oregon*, which had completed her brilliant voyage of 16,000 miles, 26 May. She was reported ready for any service and left during the day for the squadron in Nicolas Channel. At eight Sampson received the telegram announcing the intention to send 10,000 troops to Santiago and that he was expected to convoy the transports, going in person; but about midnight the department's telegram arrived, reporting Schley's intention, expressed in his telegram of the 27th, to return to Key West and asking Sampson how soon he could reach Santiago with the *New York, Oregon, Indiana* and some lighter vessels, and how long he could blockade there, sending his ships singly to a coaling point. Sampson answered this at 3 A.M. (29th), that he could reach Santiago in three days and could blockade indefinitely; that he thought he could occupy Guantanamo; and that he "would like to start at once with the *New York* and *Oregon*, arriving in two days. Do not quite understand as to the necessity of awaiting the arrival of Schley but would propose meeting and turning back the principal part of the force under his command if he has left. Try to hold him by telegraph. Watson will be in charge of everything afloat. Does the Department approve proposed action?" About noon, no reply having been received, Sampson sent another telegram urging immediate reply. A little latter came one from Commodore Schley direct and also the substance of the same repeated from the Navy Department, showing that he had arrived off Santiago and that he would remain "until coal supply of larger vessels has given out . . ."; and also announcing the capture of the collier *Restormel* by the *Saint Paul*. Sampson replied to this "Congratulate you on success. Maintain close blockade at all hazards, especially at night; very little to fear from torpedo boat destroyers. Coal in open sea whenever conditions permit. Send a ship to Guantanamo with view to occupying it as base, coaling one heavy ship at a time. Appraise captured coal, use if desired and afterward send ship in as prize."

In the afternoon the desired permission to go to Santiago was received and at 11 P.M. the *New York*, having finished coaling, left for Nicolas Channel, reaching the squadron at 7 A.M. Commodore Watson was conferred with and at 9.07, signal being made to the *Oregon, Mayflower* and torpedo boat *Porter* to form column on the *New York*, Sampson stood eastward at 13 knots. The squadron arrived off Santiago at 6 A.M. 1 June (in less than two days) having met in the Bahama Channel the *Yale* and *Saint Paul*. From Captain Sigsbee of the latter, the admiral received copies of several telegrams from Commodore Schley taken by the *Saint Paul* to Nicolas Mole, which showed that the enemy's ships had been seen in port, and that the situation would be held. As the squadron arrived, the *Colon* and one of the *Vizcaya* class were seen about seven-eighths of a mile within the entrance, but they moved out of sight almost at once, which, in the case of the *Colon*, could be done without unmooring, by veering the hawsers attached to the shore and heaving in on her chain, the distance to go to take her out of view being very slight (her log mentions leaving her moorings at this point at 10.35 A.M.). The day previous (21 May) Commodore Schley had gone aboard the *Massachusetts* and with the *Iowa* and *New Orleans* had fired upon the *Colon* and the batteries at the entrance. The ships passed the entrance twice at a speed of 10 knots and the ranges, as stated in the *Iowa's* log, at first 8,500 yards, increasing to 11,000. The total time of firing stated by the *Massachusetts* was 7 minutes 35 seconds. One shell, reported in the *Colon's* log as exploding near the stern, did some slight damage, but a battle between ships at the ranges reported in the log of the *Iowa*, 8,500 to 11,000 yards (from nearly five to over six miles), or even at 7,000 (four miles), the range first proposed, and lasting the time reported by the *Massachusetts*, could not be effective.

Sampson at once made preparations for sinking the *Merrimac*, Naval Constructor Hobson being put in charge, as he had been previously directed, as an expert, to study the question of the best steps to be taken to sink her quickly. Hobson was finally allowed to take the ship in. Many were as eager to go as he, the officers and men volunteering by the hundreds, but Sampson was moved to let it fall to Hobson from a sense of fairness, in that he had done the whole work of preparation. It was breaking day when the ship finally started and it became so light that she was recalled and sent in the night following; but her steering gear being shot away, she drifted, before sinking, too far up the channel to block it in any degree. Had her bow taken the east side of the channel at the point proposed, her stern would have swung with the tide (running flood) in such a way that the channel would have been closed almost as a caisson closes a dry dock. It was fortunate, of course, in the light of events that it was otherwise. Hobson in his graphic and most excellent account says that he would more certainly have succeeded had he not been

recalled on his first start. The writer is now inclined to agree with him and rather the more as an amend for his share in causing his recall. But the fame of an heroic act is Hobson's all the same, and the failure made the third of July victory possible.

Sampson on arrival had found the Flying Squadron moving in column east and west in face of the port. He changed this, placing the ships with their heads toward the harbor entrance on a six-mile radius, which made a semi-circle of about nine miles. (This was later reduced to four during the day and three at night, with much less for certain ships). An order of battle was issued 2 June dividing the fleet into two squadrons, one (to the east) under the personal command of the commander-in-chief, the other (to the west) under Commodore Schley. This order enjoined: «If the enemy tries to escape, the ships must close and engage as soon as possible and endeavor to sink his vessels or force them to run ashore in the channel. It is not considered that the shore batteries are of sufficient power to do any material injury to battleships.» On 6 June the batteries were actively bombarded. The next day Guantanamo Bay was occupied by the *Marblehead* and *Yankee* and thenceforward was Sampson's base; the fort at the head of the deep water bay was destroyed 15 June by the *Texas, Marblehead* and *Suwanee,* the two former coming in contact each with a heavy gun cotton mine, but, in the pious language of Captain Philip, in his report, «owing to Divine care neither of them exploded.» While every combatant is ready to suppose Providence on his side, some credit ought to be given to the barnacles which had grown so actively that the mine machinery could not operate. On the 10th, the marine battalion arrived in the *Panther* and at once went into camp, where from 11 May to the 14th it underwent a severe fire from the enemy, occupying a commanding position, in which some lives were lost. On the 14th, however, a force of two companies of marines and 50 Cubans, under Captain Elliott, attacked some 500 of the Spanish and destroyed their only water supply, from which time the bay and vicinity remained undisturbed though there was a force of over 7,000 Spanish at and near Guantanamo town, 12 miles from the bay head.

On 7 June a memorandum for night duty was issued ordering three picket launches to be placed one mile from the Morro, the *Vixen, Suwanee* and *Dolphin* on a two-mile radius from the Morro, the larger ships to come within a four-mile radius. The memorandum continued: «I again call attention to the absolute necessity of a close blockade of this port, especially at night and in bad weather. In the daytime, if clear, the distance shall not be greater than 6 miles; at night or in thick weather, not more than 4 miles. The end to be attained justifies the risk of torpedo attack, and that risk must be taken. The escape of the Spanish vessels at this juncture would be a serious blow to our prestige and to a speedy end of the war. . . .» Memorandum No. 14, issued the next day (8 June), had a most important bearing upon the final successful result. It directed the battleships to take turns of two hours each, beginning at dark, in illuminating the harbor entrance with a search light. Later a second battleship was kept close to the illuminating ship so that the former could do any firing necessary without disturbing the illumination. The ship using the search light was kept not beyond two miles from the Morro and was ferquently nearer. The effect was a complete lighting up of the harbor entrance, making it impossible for the smallest craft to appear without being seen. It was the main element, as Admiral Cervera mentions, in preventing any attempt to leave at night. Memorandum 20 of 15 June directed that the distance of four miles from the entrance during daytime should under no circumstances, even when coaling, be exceeded. The next day the batteries were again bombarded. It was clear to the admiral's mind that in themselves they were not to be taken as a serious obstruction to the fleet. The *Vesuvius* had arrived 13 June and from this time forward for many nights shook the vicinity with the explosion of her shells. While it cannot be said that they produced much actual damage, as there was so little to sustain damage, the batteries being but small objects for such practice, they certainly had a very marked moral effect upon those in the vicinity of their fall, the *Pluton,* by Spanish accounts, being so violently lifted once that every one was thrown off his feet. The *New Orleans* and *Texas* had each by order of the admiral engaged singly the batteries and it was clear that they alone were not an obstruction to the fleet; but the mines had to be reckoned with and Sampson urged the sending of the army, telegraphing that with 10,000 men the city and squadron could be captured in 48 hours. His only view of the case, and the correct one, was to land in the vicinity of the entrance, capture the batteries and occupy the adjacent positions, so that the fleet could at leisure lift or destroy the mines and enter the harbor.

When the war came the regular army of the United States had but 2,116 officers and 25,706 enlisted men. There were 25 regiments of infantry, 10 of cavalry and 5 of artillery. The bill approved 22 April declared all able-bodied male citizens from 18 to 45 liable to military duty; that the President might call upon each State and Territory for troops in proportion to its population; that the regimental and company officers should be named by the governors of the States, the general and staff officers by the President. On 23 April a call was made for 25,000 men. On 26 April additional enlistments in the regular army were authorized temporarily to a total of 62,597 men. In May the enrolments amounted to 124,776 men. A second call 25 May for 75,000 caused the volunteer army to reach in August its highest number, 216,256. Immediate steps were taken by the War Department toward concentration, chiefly at Chickamauga, Tenn., Camp Alger, Va., and at Tampa, Fla.; the last being selected as the point of departure of the invading force for Cuba, though many, including its general-in-chief advocated strongly making no move to invade the island until October on account of its supposed deadly summer climate. Historical precedents were brought to bear showing the fearful losses of expeditions of earlier centuries; with as much reason might one have

deprecated living in London because it once suffered from the plague. It was, as we came to know from the experience of the marines at Guantanamo, a question of care; but this care could not be given without experience on the part of officers and men, and the officers of the regular force were too few to count as against the rawness and ignorance of the vastly greater number of volunteer officers who had never known anything of the care of troops. The zeal and spirit of the army of volunteers, composed, as much of it was, of the best blood and intelligence of the country, were far from being an offset to their inexperience in the field. The army corps numbered eight, but the sixth was never organized. The fifth, under Major-General Shafter, at Tampa, numbering about 15,000 men; and a part of the eighth, Major-General Merritt (some 11,000 out of a total of 16,000 at San Francisco) were those actively employed before hostilities ceased. Shafter received orders 9 May "to move his command under protection of the navy and seize and hold Mariel on the north coast of Cuba, where territory is ample to land and deploy army," troops to be fully equipped, abundance of ammunition and food for men and animals for 60 days. Such orders indeed point a moral in the circumstances, and in themselves stand an all-sufficient reason for the general staff now in being. An expedition under Col. R. H. Hall had landed some arms and supplies for the insurgents and this was followed 11 May with one under Captain Dorst with 100 men of the First Infantry who attempted a landing 40 miles west of Havana but were repulsed. The failure was due partially to newspaper publicity, partially to the use of the *Gussie*, a very conspicuous and rather ridiculous looking side wheel steamer, as well known along the Cuban shore as Morro Castle. Sampson received a telegram 28 May announcing the intention to send 10,000 troops to Santiago which he was expected to convoy in person, and the War Department had at once begun to collect transports at Tampa. General Shafter telegraphed 1 June that he was progressing rapidly with loading transports and that he expected to be ready to start Saturday morning (4 June). The gunboats *Annapolis, Helena, Castine* and *Hornet* were at Tampa; when all should be ready the fleet to rendezvous to westward of Dry Tortugas, where it was to be met by the battleship *Indiana*, the *Detroit, Bancroft, Manning, Wasp*, armed tugs *Wompatuck* and *Osceola;* the whole naval force to be under the command of the senior officer, Captain Taylor of the *Indiana*. On 9 June, however, Sampson received a dispatch from Key West via Nicolas Mole that the armed yacht *Eagle* had on the night of 7 June, when 15 miles north one-half east of Bahia de Cadiz light, sighted to the north northwest an armored ship, a protected cruiser and two destroyers in fleet formation, and that the *Eagle* had scouted abreast "until character of Spanish vessels was ascertained. . . . One deep sea torpedo vessel chased *Eagle* for a short time. . . *Resolute* confirms it." The next day Sampson received a telegram from the Navy Department that the army expedition was stopped temporarily on account of the report *Eagle* and *Resolute;* that the convoy was distributed to scour the straits and re-enforce the blockade, and he was directed to send two of his fastest armored ships to search through Nicolas Channel, and then to re-enforce the convoy. The telegram asked "Are you sure all four Spanish armored cruisers are at Santiago?" The only action taken by Sampson was to telegraph that he had no confidence in the report and that he considered it very unwise to suspend operations on this account, "but even if it is found correct there is sufficient force to furnish convoy. Armored vessel was probably *Talbot* which was sighted Thursday at 9 A.M. by the *Scorpion* standing east; am confident no large ship escaped from here. . . ." His view was correct, the armored ship as is now known was the English cruiser *Talbot* which left Havana that evening and was sighted by the *Eagle* at the same time with the *Armeria* and *Supply* under convoy of the *Scorpion*. Sampson sent for the log of the *Scorpion*, determined her position at the time and so telegraphed the Navy Department. To set the matter completely at rest Lieutenant Blue, who volunteered for the service, was landed 11 June at Aserradero, 15 miles west of Santiago, whence he went inland with guides furnished by General Rabi to a hill overlooking Santiago Bay. He reported aboard his ship, the *Suwanee*, again the morning of the 13th, after a journey of 70 miles (the same officer made a similar journey 25 June to locate each ship). Sampson's telegram and Blue's report fixed the question of starting the army expedition and on the 14th the force, 819 officers and 15,058 men, was under way. There is no need to dwell upon the shortcomings of transport or organization for the movement of so large a body of men over sea; such difficulties are the natural outcome of the want of organization which existed for so many years. Almost the worst feature of the whole was the clothing worn; the men landed in the tropics in that in which they came from our coldest climates. The expedition arrived off Santiago the morning of 20 June, stopping by arrangement 20 miles south of the port. Captain Chadwick, chief of staff, was sent by Admiral Sampson in the *Gloucester* to see General Shafter, and took with him a chart of the harbor to explain to Shafter Sampson's views with regard to his proposed assault and capture of the harbor entrance in order that the fleet might enter. General Shafter at the time entirely agreed with this view, as indeed his orders of 31 May from the War Department suggested. His ship, the *Seguranca*, then steamed up to the squadron; Sampson and his assistant chief of staff Staunton, came aboard and a visit was paid to Garcia's camp near Aserradero. General Shafter apparently dropped the scheme of assaulting the batteries and determined to land at Daiquiri, 17 miles east of Santiago, used as a port for the shipment of ore by an American mining company. There were, however, no conveniences for landing, beyond a very small wooden wharf; the place was a mere indentation in the coast line giving some protection from the usual southeast swell. Captain Goodrich of the *Saint Louis* was put in charge of the landing beginning 22 June, a task which was executed with great success. In all 29 boats, of which 12 were steam launches, were furnished from the fleet besides the 23

of the *Saint Louis*. A feint was made by the fleet and 10 of the transports of disembarking at Cabañas Bay, two miles west of the harbor. General Rabi with 500 Cubans was also to make a demonstration near by. The *New Orleans, Detroit, Castine* and *Wasp* were stationed off Daiquiri, the *Helena, Bancroft* and *Hornet* at Siboney (seven miles nearer Santiago than Daiquiri), the *Gloucester* and *Eagle* at Aguadores (three miles east of the port) and the *Texas, Vixen and Scorpion at Caba ñas:* the extent of coast line covered was 32 miles. Great difficulty was experienced through the wretched conduct of many of the transport captains who were under no proper control and wandered over the sea at will. Hours were spent in finding some of them and when found they would insist upon lying miles from a shore which they could have approached with safety within a ship's length. By sunset 6,000 men were ashore with the loss of two drowned by the capsizing of a boat. The immediate desertion by the Spaniards, under the fire of the fleet, of all the points about Daiquiri and Siboney, but 10 miles from Santiago, caused the transfer to the latter points of landing operations, and this was thenceforward the army base. Wheeler, the senior officer ashore (Shafter remaining aboard until the 29th), ordered Young to make a forward movement on the 23d, which brought about the skirmish of Las Guasimas, in which the 1st and 10th Cavalry and the Rough Riders, all of course unmounted, were engaged. The American loss out of the 964 in the fight was 16 killed and 52 wounded. The Spaniards retreated leaving 11 dead. On 24 June the last of the troops had been landed and two days later the field batteries were ashore. Shafter sent a telegram to the War Department gracefully acknowledging the services of the navy: "Without them I could not have landed in 10 days and perhaps not at all, as I believe I should have lost many boats in the surf." More difficult, however, was the question of getting supplies ashore as the fleet's boats with their crews had to return to their ships; and the army had a hand to mouth existence for days which must have been a serious element, through ill nourishment, in the development of the sickness later. On the 25th and 26th Garcia's force of 2,978 was transported from Aserradero; on the 27th the 33d and part of the 34th Michigan arrived under Brigadier-General Duffield from Camp Alger and went into camp at Siboney. By 30 June the American force was in face of the Spanish positions to the east and northeast of Santiago and in the afternoon a council was called in which plans were made for the battle of next day, 1 July; Lawton's division to assault El Caney at daybreak, and afterward take position on the right of Wheeler's and Kent's divisions and assist in the general attack on the lines to the east of and near Santiago. It is impossible in the space to deal with the details of these actions, which reflected the greatest credit upon both victor and vanquished. The American force was greatly superior in numbers, the force under Generals Lawton, Chaffee, Ludlow and Colonel Miles (commanding a brigade) reinforced during the day by Bates' command attacking El Caney, numbering 6,654, against about 500 Spanish, who, occupying a strong defensive position, maintained themselves most heroically, losing 300 killed and wounded and 150 captured. Among the killed were General Vara de Rey and his two sons. The American losses at this point were 88 killed and 355 wounded. The action was most ill-advised: Had Lawton merely contained the small force at El Caney and joined on the right at once, Santiago, in all probability, would have been carried at once. The attack upon the main Spanish lines east of and near the city, along the crest of San Juan Hill, was made by the dismounted cavalry division under General Wheeler and the first infantry division under General Kent, the whole force numbering 8,336 men. Lieutenant Miley, of Shafter's staff, gives the numbers of the Spanish as 750 in the most advanced position on San Juan Hill and 3,500 immediately in the rear. There were about 1,000 men ashore from the Spanish squadron under Cervera's chief of staff, Captain Bustamente, who was mortally wounded. San Juan Hill was occupied by the Americans after a most courageous and bloody struggle with the loss of 144 killed and 951 wounded. The casualties of the day were thus over 10 per cent of the force engaged. It may confidently be said that few armies would have won success under the immense disadvantages to which Americans were subjected. Suddenly transported to a tropical climate, with clothing of a character in itself to madden a man into illness, with the scantiest of rations for days, subjected daily to torrential rains, fighting through the thickest of jungle, opposed by an entrenched foe with smokeless powder, it required to win men such as composed this force, the finest in the writer's opinion, through its practical experience and training, ever put into the field. Nor must the disabilities of the Spanish be overlooked. They were ill-fed, had long undergone the depressing effects of the tropics and were in no condition to meet a determined foe. They showed the obstinate courage always shown by their race when on the defensive, and sustained to the full its honor.

Admiral Sampson, at the request of General Shafter, had supported, on the 1st, a demonstration at Aguadores by a force commanded by General Duffield; the few Spanish seen having disappeared, the *New York* and *Oregon* fired a number of eight-inch shells over the hills in the direction of Santiago and the ships in the bay. The evening of this day Colonel Escario with 3,500 men entered Santiago from Manzanillo, a reinforcement which in the existing destitution but added to the difficulties of the Spanish. Sampson at Shafter's request bombarded again the batteries at the entrance 2 July. Shortly after, Shafter sent a message urging Sampson to force an entrance, to which reply was made that this was impossible until entrance was cleared of mines; a work of some time after the forts should be taken. Shafter stated it was impossible to say when he could take these and if as difficult as what he had been pitted against, it would require time and great loss of life. "I am at a loss to see why the navy cannot work under a destructive fire as well as the army. My loss yesterday was over 500 men. By all means keep up fire on everything in sight until demolished. I expect,

however, in time and with sufficient men, to capture the forts along the bay." Sampson at once replied that the forts could not prevent his entrance but that it was a question of mines, to attempt to go over which would certainly result in the sinking of one or more ships, thus preventing further progress by the fleet. He said: "It was my hope that an attack on your part on the shore batteries from the rear would leave us at liberty to drag the channel for torpedoes. If it is your earnest desire that we should force our entrance I will at once prepare to undertake it. I think, however, our position and yours would be made more difficult if, as is possible, we fail in the attempt." The *Resolute*, carrying 40 mines, was at once ordered from Guantanamo and Sampson purposed, as soon as the arrangements could be made for countermining, to bring up the battalion of marines, with which and with those of the squadron, about 1,000 in all, he proposed to assault the western side of the entrance, the army to take the eastern. His chief of staff went to Siboney to arrange for a consultation respecting this combined action between the two commanders-in-chief. This consultation was set for the next morning, Sunday, 3 July. During the night there were several large fires on the distant hill tops, evidently the burning of block houses. The *Massachusetts*, as soon as her searchlight duty had ended at 4 A.M. (3 July), left for Guantanamo for coal. The ships present were in order from east, the *Gloucester, Indiana, New York, Oregon, Iowa, Texas, Brooklyn, Vixen;* the armed yacht *Hist;* the torpedo boat *Ericsson* and the transport *Resolute* carrying the mines, which had been brought the day previous from Guantanamo. At 8.50 A.M. the *New York* had begun to turn toward Siboney, but seven miles from her position, to carry Sampson to the meeting with General Shafter. She had been fairly on her course from 30 to 35 minutes when, attracted by the sound of a gun from the Socapa battery, the Spanish ships were reported leaving the harbor. The flagship, then seven and a half miles east of the harbor entrance, at once turned, hoisting the signal, "Close in toward harbor entrance and attack vessels." On account of the position of the sun, behind the signal, it is not probable that this signal was read by either the *Gloucester* or the *Indiana*, both of which were nearer to the *New York* (the former less than half the distance at the time of the latter's turning) than to the *Brooklyn*. The *Teresa* and *Colon*, the one flying the admiral's flag, the other unmistakable because of her peculiar features, were named by the signal quartermaster as they came out. After the fourth (the *Oquendo*) there was a very appreciable interval before the destroyers appeared, the last emerging about 10 o'clock. Several of the ships hoisted almost at the same time the signal "Enemy's ships escaping" though the *Iowa* seems to have been the first, as from her position she had the best view into the harbor. All the ships at once closed in and began firing upon the escaping Spaniards who stood west close in shore. The American ships naturally converged to the north, taking up a more westerly course as the Spanish ships moved westerly. The *Brooklyn*, however, made at this juncture a turn with the port helm, opening the way to the west to the Spaniards, and endangering the *Texas*, which backed her engines to avoid collision. One after the other the *Teresa* and *Oquendo* were seen to turn inshore afire and they were beached, the *Teresa* five and one-half, the *Oquendo* six miles west of the harbor entrance. The destroyers *Pluton* and *Furor* were fired upon by the *Indiana* and *Iowa*, but were destroyed in the small bight four miles west of Santiago largely by the fire of the *Gloucester* which engaged them with the utmost intrepidity. They were also fired at by the *New York*. The *Viscaya* and *Colon* were still steaming west but the former hauled down her colors and turned in to the beach at Aserradero, 14¾ miles from the harbor, crossing the bows of the *New York* within a few hundred yards. The flagship signaled the *Indiana* to return off the port. The *Iowa* remained near the *Viscaya* with the *Ericsson* and *Hist* to rescue the *Viscaya's* crew. The *Gloucester* rendered the same service to the *Teresa* and *Oquendo*, assisted later by the *Indiana, Iowa* and *Hist*, a duty which was rendered under great difficulties and danger. The chase of the *Colon* continued, the ships in pursuit the *Brooklyn, Oregon, Vixen, Texas* and *New York* (taken in order from seaward). The *Oregon* began firing her 13-inch guns at 10,000 yards range and the shot went over; her eight-inch guns were also tried but fell short as did the *Brooklyn's*. The *Oregon* reduced the range to 9,500, to 8,500, then 9,000, when at 1.20 the *Colon* hauled down her colors, turned inshore and ran her bows on the steep beach where empties the little river Turquino under the mountain of the same name, the highest in Cuba (8,400 feet). The nearest ships had still over five miles to run to reach this point and on arriving near, Captain Cook of the *Brooklyn* boarded the *Colon* and received her surrender. He stopped on his return and reported aboard the *New York* which was the third ship to arrive, having passed the *Texas* and *Vixen*.*

The *Oregon* was ordered to take charge of the *Colon*. The ship, however, was clearly sinking. All her sea valves had been opened and though every effort was made to save her, and when the rising tide had floated her during the evening she was pushed hard ashore by the *New York*, she turned over on her side as she sunk and there remains. The *Resolute*, ordered by the commander-in-chief to report at Guantanamo the exit of the Spanish squadron, had met off Daiquiri an Austrian man-of-war whose flag was so similar to that of Spain that a warning memorandum had been issued in expectancy of a visit from the *Maria Theresa*, which this ship turned out to be. The *Resolute*, taking the ship for Spanish, turned westward, warned the *Harvard* at Siboney, which also sighting the stranger stood west with the same news. The *Resolute* arrived at Rio Tarquino with the news, the *Brooklyn* was ordered to investigate the report and proceeding to the eastward met the Austrian vessel and after some delay ascertained her character. The distance from the Santiago entrance to the point where the *Colon* was beached is 52 nautical miles. Taking the

* The log of the *Texas* is inaccurate in stating that the *New York* and *Vizen* came up about 3.00; the writer has a photograph taken from the *Texas* showing the *New York* passing the *Vizen* and from a direction which shows the *New York* must have passed the *Texas*. The time is marked by the signal flying from the *New York* which the *Brooklyn's* log gives as received at 1.50. The *New York's* log gives 2.00 as the time.

ships successively from the east to west positions, the *New York* was 59½ miles, the *Oregon* 53, the *Texas* 50¾, the *Brooklyn* 49½ miles from this point when the Spanish ships came out. Allowing five minutes to get headway and two miles for changes of direction of the *Brooklyn*, the speeds of the *Oregon* and *Brooklyn* to 1.20 P.M., when the *Colon* surrendered and these ships as established by the *Oregon's* gun ranges were four and one-fourth miles east of the *Colon's* turning in point, were for the *Oregon* 13.37 knots and for the Brooklyn 12.06; for the *New York* to the time of stopping at 2 P.M. at the point of beaching (allowing five minutes to turn) 13.73; the *Texas* to the same point, and allowing one mile lost in backing and her time of arrival as 2.05, 11.72 knots.

Admiral Cervera and a large number of his officers and men were received on board the *Iowa*, but all these as well as those on board the *Resolute* from the *Colon* were transferred to the *Harvard* and *Saint Louis* later; 1,615 men were taken to Portsmouth, N. H., and interned; the larger number of officers were cared for at Annapolis. The total Spanish loss was 353 killed or drowned and 151 wounded. The American loss was one man killed aboard the *Brooklyn*. There was the same disparity of damage as at Manila, in no wise to be accounted for by disparity of force. The Spanish were greatly outmatched in heavy guns, having but 6 11-inch against the 14 12- and 13-inch and 38 8-inch of the Americans; but in rapid fire of lesser calibre, which should have done some damage against unarmored parts, they were practically equal, having 10 6-inch, 30 5-inch and 6 4.7-inch against the American 14 6-inch, 12 5-inch and 18 4-inch.

The next evening, 4 July, at midnight the searchlights showed a large ship in the entrance to Santiago Harbor. This, as known later, was the cruiser *Reina Mercedes* sent down to block the channel. She was sunk by the gunfire of the *Texas* and *Massachusetts* and later raised and sent to the United States. The destruction of this squadron was virtually the end of the war.

The firing on shore had been renewed the morning of the 3d, but at 8.30 A.M. General Shafter sent a letter to the Spanish commander saying that unless he should surrender he would be obliged to shell the city and allowing until 10 next morning for women and children to leave. At 6.30 P.M. a letter was received declining surrender, but Shafter on request of the various consuls delayed further action until the 5th. On 6 July Sampson's chief of staff visited General Shafter with reference to further action, and the result of the conference was that a letter was sent the Spanish commander drafted by Captain Chadwick and signed by General Shafter giving the facts of the destruction of the Spanish ships and the ability of the squadron to shell his position with 8- and 13-inch shell; it urged surrender, suggesting a reference of the situation to his government, in the meantime the cessation of hostilities to continue. On 8 July the Spanish general offered to leave Santiago with arms and baggage provided he should not be molested before reaching Holguin. This was referred to Washington and was declined. At 4 P.M. 10 July the truce was ended, and firing began on both sides, the heavy shells of the navy during this and the next day falling in the town and destroying 57 houses. At 2 P.M. the 11th the firing ceased and was not renewed. General Toral was informed of the heavy American reinforcements, and surrender was again demanded, the government of the United States offering to transport the entire Spanish command to Spain. A surrender was agreed upon 14 July, this to include not only the troops in Santiago but all those of the department, a total of about 24,000. The city was delivered to the Americans 17 July. The result was fortunate for the American force in view of the sickness which had rapidly developed through the constant rains, bad shelter and insufficient food in the earlier days of the investment. The situation became such that the general officers united in advising the removal of the army from Cuba. On the other hand the marines at Guantanamo, under the excellent conditions of shelter and food and water supply which they had been able to keep up, were remarkably healthy, the sick list not rising above that which was usual at home ports; the same can be said of the fleet, which kept its normal health. General Miles had arrived off Santiago 11 July in the *Yale* with 1,500 troops. As soon as the surrender of Santiago was determined an expedition to Porto Rico under his command was organized, which sailed 21 July with 2,000 additional men. The battleship *Massachusetts* and 13 other naval vessels were detailed for service with the expedition.

There were in Porto Rico 8,223 regular Spanish troops and 9,107 volunteers. The destroyer *Terror* and small cruiser *Isabel II* were at San Juan, the former badly injured in an action with the *Saint Paul* 22 June. She had been struck by two five-inch shells, had three men killed and her machinery so damaged that she returned to port with difficulty. The *Gloucester* seized Port Guanica 25 July and Ponce surrendered to the *Dixie* 28 July, in each case without appreciable resistance. Both places were occupied by American troops. Reinforcements were rapidly arriving, there being available by the end of July a force of 9,461 officers and men (rising by the end of August to 16,973). Advance was made from Guanica, Ponce and Arroyo. Several skirmishes ensued, in which three enlisted men were killed and four officers and 36 men wounded. The cessation of hostilities 12 August prevented the more serious work which would probably have been met in carrying the Spanish intrenched positions in the advance to San Juan.

General Merritt in command of the expeditionary force to the Philippines had arrived 25 July. Accompanying him was a force of 4,847 officers and men, part of which did not arrive until 21 July.* He had been preceded by the expedition under General Anderson with a force of 2,501, arriving at Cavite 30 June, and by that under Gen. F. V. Greene of 3,586 July 17.

The situation at the time of General Merritt's arrival was quiescent, but was seriously complicated by the presence of a Filipino army of probably 12,000 well-armed men under Aguinaldo, who had proclaimed an independent government. The investment, however, proceeded without reference to this force and under the strain of considerable firing from the Spanish

*1,682 officers and men under Gen. E. S. Otis arrived 21 August; three other detachments left San Francisco successively 19, 23 and 29 July, making a total of 641 officers and 15,058 enlisted men.

lines at night. A joint demand on the part of the military and naval commanders-in-chief for surrender was made 7 August. The governor general declined but offered to refer to his government. This was declined by the American commanders and the city was taken with but a show of resistance, 13 August. The total army casualties during the investment and assault were 17 enlisted men killed and 10 officers and 96 men wounded. Commodore Watson, relieved in the second command of the blockade on the north coast of Cuba by Commodore Howell, had been assigned 7 July to the command of the squadron to join Admiral Dewey in the Philippines. This was to proceed, until their separation in the eastern part of the Mediterranean, in company with the whole available armored force under Admiral Sampson. The protocol suspending hostilities, signed 12 August, of course ended the expedition and Sampson with the battleships and armored cruisers of his fleet arrived at New York 20 August, meeting an improvised reception which in spontaneity, magnitude and picturesqueness, combined as they were with the sentiment attaching to a victorious fleet, has never been equaled in our country. The total losses had been in the army 279 killed, 1,465 wounded; in the navy 16 killed, 68 wounded.

The Spanish War, short and comparatively bloodless as it was, lifted the United States to a new plane. They became at once one of the dominant factors in world politics. Whatever the divergence of views, ethical or financial, in regard to the territorial acquisitions, there can be none as to the vastness of the change, considered politically. The primary cause of the war, the freeing of Cuba, has become a secondary event in face of the great changes wrought in our relation to the Caribbean and more particularly to the momentous question of dominancy in the Pacific. The ownership of Hawaii and the Philippines (the former a direct outcome of the war also) are elements in this natural destiny of the highest importance. From this point of view, and there is nothing facing the world of greater import than the future of eastern Asia, the war did much to put the United States in a position to meet the coming emergency. It also gave us a navy, an adequate army and the necessary bases for action, if action be forced upon us.

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40. TERRITORIAL EXPANSION. The territorial expansion of the United States dates from the peace treaty of 1783, by which their independence was recognized and their boundaries named. There had been much uncertainty about the boundaries of the colonies for a considerable period prior to the War of the Revolution, and especially so in years immediately preceding the Declaration of Independence. The early grants to the colonies were made "to the South Sea," by which was meant the Pacific Ocean, though it was not then supposed that the continent was more than a few hundred miles wide. Gradually, however, the French moved up the Saint Lawrence and down the Mississippi Valley, establishing their claim to the great central area, and the Spanish gradually extended their claims northward at the extreme west, so that the claims of the colonies that their territory extended to the Pacific gradually dwindled, in view of the fact that the mother-country made no attempt to prevent these encroachments on the west. The increasing claims of the French in the Mississippi Valley and finally their claims to the Ohio Valley led to hostilities between the English and the French colonists and they were supported by their respective governments. In 1753, the French having begun the establishment of a military post at the present site of Pittsburgh, George Washington was sent by the governor of Virginia to warn them that the territory was claimed by the English colonies and must not be occupied by the French. Their reply was that they also claimed the territory by exploration and settlement and would hold it. This led to an attack by the English in the following year, in which they were repulsed by the French, and this precipitated the war between the French and English, which resulted in the expulsion of the French from the continent. The treaty between the French and English governments, by which the French withdrew from continental America, was made in 1763, and fixed the Mississippi River as the western boundary of British territory. It subsequently developed that France had a few months before secretly ceded her claims west of the Mississippi to Spain. The acceptance of the terms of this treaty of 1763 by the British government terminated the claims of the colonies that their boundaries extended to the Pacific. By this same treaty of 1763, made between England, France and Spain, Florida passed to the control of England, and as it was deemed advisable to divide it into two provinces or colonies, the British government concluded to add to the western section a narrow strip from the southwestern part of the great colony of Georgia. Accordingly a strip west of the Appalachicola River, which had been formerly a part of Georgia, was attached to West Florida, against the protest of Georgia. The war between Great Britain and France regarding the territorial area in America had also resulted in the transfer of the French colony of Quebec to British control, and in 1774 the British government attached all of the territory north of the Ohio River and west to the Mississippi to the province of Quebec, making it, for purposes of government, a part of that province. This gave great dissatisfaction to the people of Massachusetts, Connecticut, New York and Virginia, since each of

these claimed that a part of the section north of the Ohio was within its original grant and should not be taken from them. And this was one of the many causes of dissatisfaction which finally culminated in the War of the Revolution.

Thus when the Revolutionary War closed there were several territorial questions to be settled, in making the peace treaty: first and most important, whether the country north of the Ohio was to remain a part of Quebec, or be recognized as still a part of the former colonies; second, whether the section which had been taken from Georgia at the southwest and added to Florida should be restored as a part of the territory of the United States, in view of the fact that Great Britain had meantime receded Florida to Spain; and, third, what should be the boundary at the extreme northwest. Virginia had held that her original charter gave her the territory north of the Ohio to the Mississippi River, including that lying west of the lakes, and besides that was the important fact that it had been occupied, in some degree at least, by the colonial forces during the War of the Revolution.

The result of these uncertainties as to boundary was that the commissioners sent to Paris to negotiate a treaty of peace with Great Britain were instructed to claim all of the territories in question, but to be guided by the French government in their work. These commissioners, Benjamin Franklin, John Adams, John Jay and Henry Laurens, soon after their meeting, found a disposition on the part of the French government to advise that the British retain the country north of the Ohio, and even that the country south of the Ohio, between the Cumberland Mountains and the Mississippi, be declared neutral territory for the use of the Indians. As a result, the United States commissioners broke off their relations with the French and negotiated the treaty according to their own views. By the boundary lines finally determined they obtained the recession to the United States of the small strip at the southwest corner of Georgia, now the southern part of Alabama and Mississippi, also the entire country north of the Ohio to the Great Lakes and that section west of the Great Lakes to the Mississippi and as far north as the present boundary line. These may be properly said to be the first additions to the territory of the United States, since all of the area in question was more or less in dispute under the latest acts of the British government prior to the War of the Revolution and the organization of the 13 colonies as the "United States of America."

The next addition to the territorial area of the United States, and that which is usually spoken of as the first addition to the territory of the United States, was the Louisiana Purchase. France had included the city of New Orleans and a small tract of country on the eastern bank of the Mississippi near its mouth in the territory ceded to Spain when she abandoned the continent of North America in 1763. This gave the control of the mouth of the Mississippi to the nation controlling this territory. Following the close of the War of the Revolution, the area west of the Alleghenies had rapidly increased in population, and it was essential that this population should have an opportunity to reach the sea by the Mississippi River. An agreement was made with the Spanish government in 1795 by which citizens of the United States should have the privilege of depositing their goods in New Orleans for transshipment abroad, without payment of duties, and that incoming goods should have similar privileges. In 1802, however, it became known that Spain had ceded the Louisiana country to France, by a secret treaty made in 1800, and this fact caused great alarm among the people of the United States, lest their privilege of reaching the ocean through the Mississippi should be lost. A resolution was introduced in Congress authorizing the President to seize the city of New Orleans, but a substitute was adopted authorizing the President to send a commission to France and offer $2,000,000 for the city of New Orleans. James Monroe was sent as the special commissioner and authorized to co-operate with our Minister to France, Mr. Livingston. Napoleon, who was about entering upon war with the English, saw that his great possessions in America would be a source of weakness to him in such a war, and offered to sell the entire Louisiana territory to the commissioners. While they were not authorized to make such an agreement, they determined to assume the responsibility of doing so, and after some negotiation an agreement was made by which the entire territory was to be ceded to the United States for the sum of $15,000,000, of which $11,250,000 was to be in bonds of the United States, the remainder to be paid to citizens of the United States having claims against France. The treaty reached the United States in July 1803, a special session of Congress was called in the following October and after two days of discussion the treaty was ratified, and in December the city of New Orleans and the vast territory thus acquired was turned over to the United States. The population at that time was about 100,000, of which about one-half were whites, 10,000 mulattoes and 40,000 negroes. See UNITED STATES — THE LOUISIANA PURCHASE.

The next addition to the territory occurred in 1810–12, in the form of a small section of territory which had been a part of West Florida during the time that Great Britain controlled Florida. After the recession of Florida to Spain by Great Britain, the English citizens of the western part of West Florida became dissatisfied, and especially so in view of the reports that Spain had sold West Florida to France. They held a convention in 1810, declaring themselves a free and independent State. A communication was sent to the President of the United States, who instead of recognizing the new republic directed the governor of New Orleans territory to take possession of the territory, basing this action upon a claim that the territory had been sold to France and should have been included with the cession of Louisiana territory by France. The annexation does not seem to have been seriously objected to by the people of the area in question, but was met with protests on the part of both Spain and Great Britain. No further action was taken, however, and in 1812 the control of the United States was extended to another small section lying east of that occupied in 1810, this action being based upon claims similar to those upon which the occupation of 1810 was made. These two additions gave to the United States the small section by which Alabama and

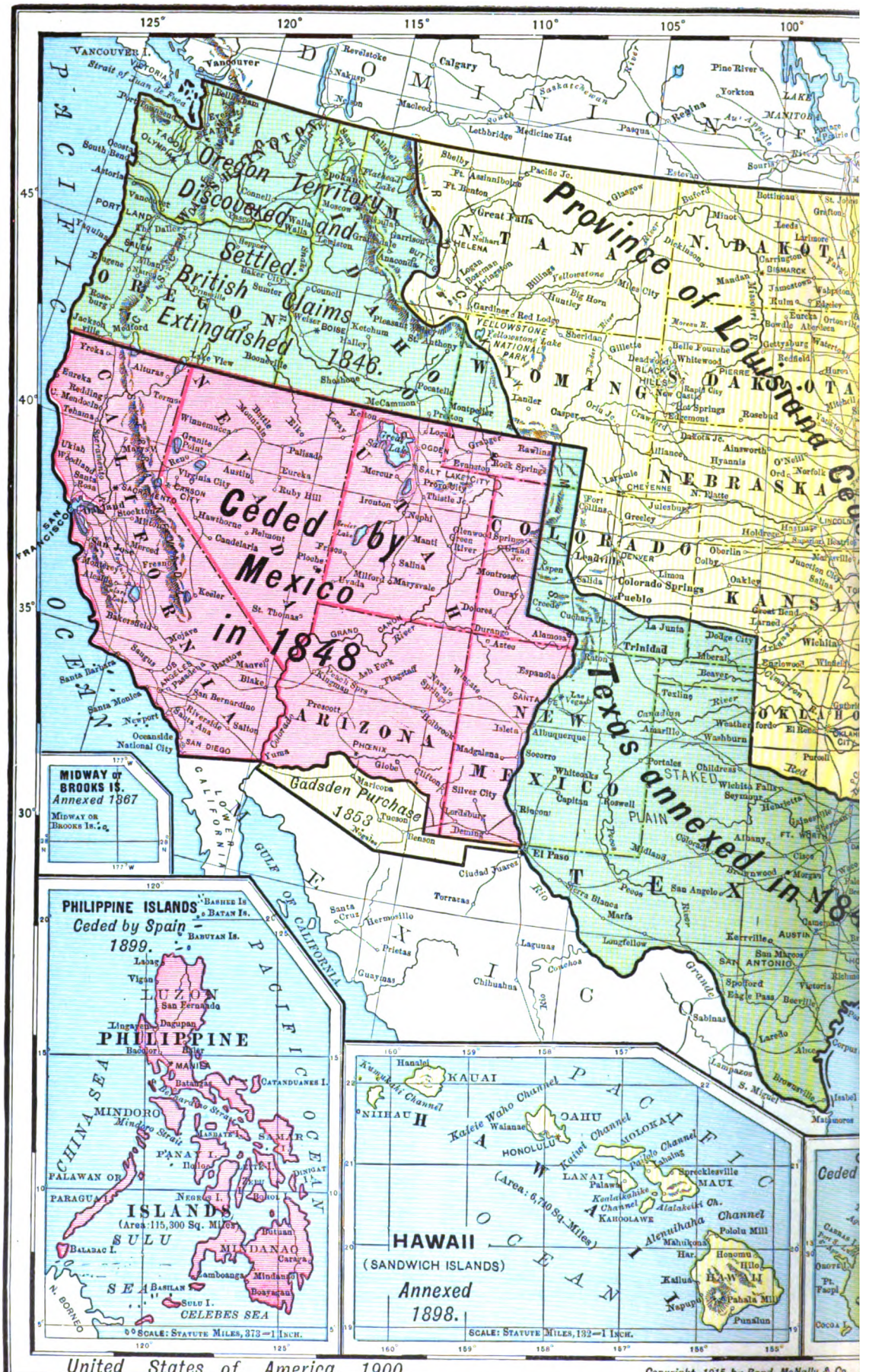
Mississippi now have a frontage upon the Gulf of Mexico.

The next addition to the territory of the United States, and that which is usually known as the second, was the purchase of Florida from Spain, in 1819. Florida had been continuously in control of Spain from the discovery to 1763, when Spain ceded it to Great Britain in exchange for a part of Cuba, which Great Britain had seized during the war with France, because of the aid which Spain gave to France in that war. In 1783 England receded Florida to Spain, and in 1785 Spain sold West Florida to France, and it was upon this fact of the ownership of that territory by France that the United States claimed that it was included in the cession of the Louisiana territory in 1803, and upon this claim was based the occupancy in 1810 and 1812 above described. Florida was greatly desired as a part of the United States, both for the purpose of extension of the slave area and because of the fact that the presence of this foreign territory alongside of that in which slavery existed resulted in constant friction between the people of the two sections. The escaping slaves from the adjacent territory of the United States found Florida a safe retreat and there was also much bitterness over the fact that Florida had been made the headquarters of a British force during the war of 1812–14. Repeated offers were made to the Spanish government for its purchase but without avail, but finally, in 1819, the Spanish Ambassador at Washington signed a treaty by which Florida was to pass to the United States on payment of $5,000,000 in full extinction of the claims of certain American citizens against the Spanish government. The treaty was ratified in 1821 and the territory taken possession of by the United States, which in 1822 established the "Territory of Florida." See FLORIDA.

The next addition to the territory of the Union was that of Texas. It was desired as a part of the Union, especially by those interested in the extension of slave area and slave States. It was formerly a part of the Spanish colony of Mexico. In 1810 the people of Mexico revolted against Spanish rule, and in 1822 were successful, and in 1824 the republic of Mexico was established. The two provinces, formerly known as "Texas" and "Coahuila," were made a single state of the new republic of Mexico, under the name of Texas. The desire of the people of the United States for this territory led to an offer of $1,000,000 to the Mexican government for its purchase in 1827 and another of $5,000,000 in 1829, but each was rejected. Meantime a large number of persons from the southern part of the United States settled in Texas, and in 1833 Texas attempted to obtain a peaceable separation from Mexico and independence, but without success. In 1836 Texas seceded from Mexico and established itself as a republic. In the election for President which followed, an almost unanimous vote was cast for annexation to the United States, but the application for admission, made by its Minister at Washington, was not favorably received by Congress. In 1844 another treaty of annexation was made but rejected by the Senate. The Presidential election in the United States which soon followed hinged largely on this question, and the sentiment was apparently in favor of annexation, and in January 1845 Congress passed a resolution giving "consent that the territory properly included within the Republic of Texas may be erected into a new State to be called the State of Texas." This was accepted by the Congress of Texas and by popular vote in that republic, and in December 1845, a joint resolution was passed in the Congress of the United States admitting Texas as a State. Thus, Texas passed from the position of an independent republic to that of a State of the United States, without a treaty or without passing through the Territorial stage which usually preceded the formation of States of the Union. See UNITED STATES — ANNEXATION OF TEXAS.

The next great step in the development of the territory of the United States was the favorable settlement of the pending question between the United States and Great Britain regarding the control of the Oregon Territory. This territory had been claimed by Spain, Great Britain and the United States on grounds of exploration, and been jointly occupied by Great Britain and the United States after 1818, pending a settlement of their respective claims. Meantime the treaty of the United States with Spain, made in the purchase of Florida, had resulted in the abandonment by Spain of her Oregon claim and the fixing of the boundary line between the Oregon country and Spanish territory, which then included all of what is now known as California, New Mexico and Utah. This strengthened the claim of the United States to the Oregon country, and by 1846 the demand of the people of the United States for a settlement of the boundary line became so great that there was serious talk of war with Great Britain to determine the question. Finally, in the year 1846, a proposition was made by the British government fixing the boundary line on the 49th parallel and the Straits of Fuca. This was accepted and the Oregon country south of that line became an undisputed part of the territory of the United States. See NORTHWEST BOUNDARY.

The next addition to the national territory was what is known as the Mexican cession. A quarrel had arisen between Mexico and the United States, shortly after the annexation of Texas, regarding the boundary line between that area and Mexico, the Mexican government holding that the Nueces River was the southern boundary line of Texas, while the United States held that the Rio Grande was the boundary. The result was the war with Mexico, in which the United States was successful in every engagement, and it was followed by the cession by Mexico of the great area which includes the present States of California; Utah, part of Colorado, a small part of Wyoming and the Territory of Arizona and a part of New Mexico. The eastern part of New Mexico was jointly claimed by Texas and by the United States as a part of the Mexican cession, and this claim and the control of about 125,000 square miles of Texas was settled by payment to Texas by the United States of $10,000,000. The area thus purchased from Texas now forms part of New Mexico, Oklahoma, Kansas, Colorado and Wyoming. The sum paid to Mexico for the magnificent area which was ceded to the United States at the close of the war was $15,000,000 in cash and a settlement of claims of citizens of the United States to the extent of $3,200,000



United States of America, 1900.

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Territory of the Original Thirteen States as recognized by Great Britain in 1783
Ceded by Spain in 1819
Ceded by France in 1803
THE WIDER PINK SHADING ALONG THE ATLANTIC COAST COVERS ALL THE SETTLED TERRITORY IN THE UNITED STATES AT THE CLOSE OF THE REVOLUTIONARY WAR.
ALASKA
Ceded by Russia. 1867.
PORTO RICO
Ceded by Spain 1899
WAKE ISLAND
Annexed 1899.
PART OF SAMOA ISLANDS
Acquired 1900
SCALE: Statute Miles, 252 = 1 Inch.
Longitude West from Greenwich.

The last addition to the contiguous territory of the United States was what is known as the Gadsden Purchase (q.v.). It is a comparatively small and unimportant strip of territory lying between the Mexican cession and Mexico, south of what is now New Mexico and Arizona. It was claimed by both Mexico and the United States, and the dispute was settled by a payment of $10,000,000 by the United States for the territory. The purchase was negotiated by the United States Minister to Texas at that time, James Gadsden, hence the title, "Gadsden Purchase." The transfer occurred in 1853.

The first addition of non-contiguous territory occurred in 1867 by the purchase of Alaska (q.v.). The territory had been acquired by Russia, by discovery in 1741 and settlement in 1784, and a considerable industry in furs and shipbuilding developed. After the discovery of gold in California the Russians in Alaska traded with the people of California, especially prior to the development of transportation systems between California and the eastern coast, and in this manner the people of San Francisco became aware of the value of the fur business, and probably of the existence of the precious metals. The California members of Congress urged its purchase; bills to that effect were introduced in Congress, negotiations were opened with Russia through its Minister in Washington, and after considerable delay the agreement was made and the purchase consummated in 1867, the purchase price being $7,200,000. The Russian government was moved to this sale of its territory in part by its disputes with Great Britain regarding boundary lines between Alaska and British North America, and chiefly by the great distance at which the territory lay from its possessions in Europe and Asia. Alaska has proved a very important contributor to the requirements of the United States, in furs, salmon and other fish, copper and gold.

The Territory of Hawaii (q.v.) was the first island territory annexed by the United States. Negotiations for the annexation of these islands began in 1854, when a treaty of annexation was framed under President Pierce's administration, but the sudden death of the king of the islands before its completion terminated the negotiation. In 1876 a reciprocity treaty was made with the islands by which the products of the islands were admitted free of duty into the United States and those of the United States admitted free into the islands, and this developed commercial and other relations of the two communities very greatly. In 1893 a revolution occurred in the islands and application was made to the United States for annexation and a treaty framed and laid before Congress. It had not been acted on, however, at the close of the term of President Harrison and his successor, President Cleveland, withdrew it. On the inauguration of President McKinley the application for annexation was renewed, and after some delay Congress passed a joint resolution annexing the islands, and they were subsequently given a Territorial form of government and made a customs district of the United States, so that all merchandise passes between them and the United States free of duty, just as it does between the various States of the Union. The trade between the Hawaiian Islands and continental United States aggregated (1919) $136,591,198, the merchandise sent from the islands being chiefly sugar.

Porto Rico (q.v.), Guam (q.v.) and the Philippine Islands (q.v.) were seized by the United States during the war with Spain, inaugurated in 1898 for the purpose of compelling that government to terminate her oppression of the people of Cuba. At the close of that war, in which the United States was successful, the islands were transferred to the United States by Spain, on the payment of $20,000,000 by the United States. While the treaty did not specify the precise purpose of the payment of the $20,000,000, it was understood that Porto Rico and Guam were retained by the United States under the rules of war, and that the payment of the sum named was with reference to the Philippines. Porto Rico has been made customs district of the United States and the commerce between that island and the United States is not subject to any customs duties. It has grown from about $4,000,000 per annum, before the transfer, to about $22,000,000 in 1903 and $128,913,436 in 1919, the merchandise sent to continental United States being chiefly sugar, tobacco and fruits. Merchandise from the Philippines coming into the United States enters free of duty, and merchandise from the United States enters the Philippines duty free. The tariff of the Philippines differs from that of the United States; in the case of Porto Rico and the Hawaiian Islands the tariff of the United States applies to merchandise from foreign countries, but all merchandise between the islands and continental United States passes duty free in both directions, as does also merchandise passing to and fro between Porto Rico and the Hawaiian Islands; while the Philippine Islands trade bears the same relation to that of Porto Rico, the Hawaiian Islands and Alaska as to continental United States. Porto Rico is governed by officers appointed by the President and a legislature elected by the people. The Philippines were governed by a commission appointed by the President of the United States, the commission being made up in part from citizens of the island and a part from citizens of the United States, but in 1916 the commission was abolished and a legislature created to consist of a Senate of 24 members and a House of Representatives of 90 members. The trade between the Philippines and the United States amounted in 1919 to $151,461,636, the chief exports of the Philippines to the United States being cocoanut oil, copra, manila hemp, sugar and tobacco.

The island of Tutuila, one of the Samoan group in the south Pacific, passed under the control of the United States in 1899. The group had been for many years under a joint protectorate of the United States, Great Britain and Germany, but in that year the joint protectorate terminated, and the island of Tutuila, whose people had long ago expressed a desire for annexation to the United States, was annexed. The island is small, its chief importance being the possession of a fine harbor, the best in the south Pacific. See SAMOAN ISLANDS.

Panama Canal Zone.— The United States by a treaty with the republic of Panama in 1904 obtained the privilege of constructing a ship canal across the Isthmus of Panama and the control in perpetuity of a strip of land 10 miles

wide for its construction, maintenance and operation. The sum paid for this privilege was $10,000,000, and in addition there was to be paid the further sum of $250,000 per annum as long as the occupancy shall continue. The United States did not acquire title to the territory but merely a perpetual right of occupation, use and control. (See PANAMA CANAL). The area, however, is classed as a part of the non-contiguous territory of the United States in the United States Statistical Abstract, issued by the Department of Commerce.

Virgin Islands.—The islands of Saint Croix, Saint Thomas and Saint John, formerly known as the Danish West Indies, purchased by the United States from Denmark in 1917, for the sum of $25,000,000. They had been long a subject of negotiation between the Danish government and that of the United States at prices ranging from $5,000,000 to $15,000,000, but the several propositions failed to receive the necessary legislative action for ratification. In 1916 war conditions rendered it advisable that the islands be promptly acquired in order that the United States government should be able to fortify and occupy as a naval base the harbor of Saint Thomas, known as the "Gibraltar of the West Indies," and considered of especial importance in the protection of the Panama Canal. President Wilson negotiated a treaty of purchase, naming a price of $25,000,000, and recommended that Congress ratify it, which it did, and the $25,000,000 was promptly paid and the title to the islands passed to the United States on 31 March 1917. Domestic products of the islands enter the United States free of duty and United States products enter the islands free of duty. A governor was appointed by the United States government to administer the laws in force in the islands pending legislation by Congress for their permanent government. The trade between the United States and the islands amounted in 1919 to $3,192,132.

EXPANSION OF THE TERRITORY OF THE UNITED STATES FROM 1800 TO 1917.

	Year	Area	Cost
Louisiana Purchase	1803	875,025	$15,000,000
Florida	1819	70,107	a6,489,768
Texas	1845	389,795	.....
Oregon Territory	1846	288,689	.....
Mexican cession	1848	523,802	b18,250,000
Purchase from Texas	1850	(c)	10,000,000
Gadsden Purchase	1853	36,211	10,000,000
Alaska	1867	599,446	7,200,000
Hawaiian Islands	1897	6,740	.....
Porto Rico	1898	3,600	.....
Guam	1898	175	.....
Philippine Islands	1899	143,000	20,000,000
Samoan Islands	1899	73	.....
Additional Philippines	1901	68	100,000
Panama Canal Zone	1904	436	d10,000,000
Virgin Islands	1917	175	25,000,000
Total area added	.....	2,937,342	$122,039,768

(a) Includes interest payment.
(b) Of which $3,250,000 was in payment of claims of American citizens against Mexico.
(c) Area purchased from Texas, amounting to 123,784 square miles, is not included in the column of area added, because it became a part of the United States with the admission of Texas.
(d) The United States government by the payment of $10,000,000 and an annual payment of $250,000 acquired the right in perpetuity to construct and maintain the canal and to occupy a strip five miles in width on each side thereof.

See also UNITED STATES—THE COLONIAL AND TERRITORIAL SYSTEMS.

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41. STATE CONSTITUTIONS (1789-1919). The American Union is composed of 48 States or commonwealths, each of which has a body of fundamental law known as a constitution. The sphere of government activity which may be covered by the State has been negatively defined in the Constitution of the United States (Article X of the amendments): "The powers not delegated to the United States by the Constitution, nor prohibited by it to the States, are reserved to the States respectively or to the people." Among these powers which thus inhere in the people of the several States are those of determining the form which their own government shall take, with the sole provision that it must be republican in form and of drafting their own fundamental law, subject to limitations imposed by the Federal Constitution.

Within the limits of the power thus defined, the State is supreme and in no way subordinate to the national government. The vast scope and sovereign character of this State activity seemed to substantiate the doctrine of State sovereignty. But the Civil War definitely and finally decided that the State is not sovereign, although it exercises many of the powers usually regarded as sovereign. The accepted interpretation of the relation of State and Federal governments under the Constitution is that neither is sovereign. The people of the United States are alone sovereign. They have made both the Federal government and the States their agents for certain specified purposes and for those purposes each is supreme and uncontrollable by the other. The organs of the State are concerned solely with those powers reserved to the States and do not possess and cannot have imposed upon them by the Federal government duties which are given by the Constitution of the United States to that government. The Constitution of the United States places upon the State a few, but very few, duties in connection with the conduct of the Federal government. The most important of these are those of electing the United States senators; of conducting the election of Presi-

dential electors and of members of the House of Representatives, and of providing a militia for Federal use in certain contingencies. Disregarding, for the purpose in hand, these limitations and exceptions, we may treat the State constitutions as if they operated within the several States to the exclusion of all other authority.

The closing years of the colonial period saw the 13 colonies in the possession of constitutions, either written or unwritten, which were in most respects essentially similar and which were, on the whole, well adapted to the needs of the inhabitants. The severance of the political ties which had bound the colonies to Great Britain made necessary the adoption of bodies of fundamental law for the new States. With the exception of Rhode Island and Connecticut, all of the original States had adopted new constitutions when the present Federal Constitution went into effect. In Massachusetts a convention (1780) draughted a constitution and submitted it to the people for ratification. New Hampshire adopted her first constitution (1776) without popular ratification, but submitted a second constitution, drawn up by a convention, to the people, by whom it was adopted in 1784. Rhode Island and Connecticut, whose colonial charters granted in 1662 and 1663, needed few changes to adapt them to the needs of Statehood, did little more than to substitute the name of the people for that of the king and continued these documents as their constitutional law until 1842 and 1818 respectively. In the remaining nine States the constitutions were in every case adopted by conventions, without submission to popular vote, although in only one State, Delaware, had the convention received a formal mandate for so doing. In each of these States, except Delaware, the convention exercised the powers of a legislature as well as those of a constitutional convention. These Revolutionary constitutions were very short and most of them hastily constructed. They contained little besides a bill of rights and an outline of the frame of government. Their chief purpose was to define the fundamental principles of civil liberty and "to distribute all, rather than to withhold any, of the powers of government."

The history of the colonial period had taught the people that the legislature was the protector of their rights and liberties and that the other two departments were to be feared and guarded against as the representatives of the English Crown; hence, in framing their new constitutions they gave predominant weight to the legislature and defended the rights of the people against executive and judicial encroachment by provisions in their declarations of rights and further by subordinating both, and especially the former, to the legislature. In eight of the original States, the governor was appointed by the legislature and in Massachusetts alone did he receive the veto power. The highest judges were in no case elected by the people. In nine States they were chosen by the legislatures, in three by the executive and council and in one by the executive council alone. The possession of a freehold or the payment of a tax were qualifications required of all voters, with a few minor exceptions, as in Rhode Island, where the eldest son of a voter who qualified by the possession of property of the value of $2,000 or of $100 a year, could vote, or in Pennsylvania, where the sons of a taxpaying voter were likewise privileged to vote. South Carolina alone imposed a religious qualification: belief in God. In the five States where the governor was elected by the people, a higher property qualification was demanded for the electoral franchise in voting for governor than for members of the legislature. Nearly all of the States required additional qualifications for office holding. In six States, property qualifications, ranging from a freehold to $50,000, were demanded of the governor and six prescribed a religious qualification for the same office. New Hampshire, Maryland and North Carolina permitted none but Protestants to occupy the governor's chair; Massachusetts none but Christians, while Delaware made belief in the Trinity, and Pennsylvania and North Carolina belief in God and in the divine authority of the Bible, necessary qualifications.

Four fairly well-defined periods can be traced in the development of American State constitutions since the Revolution: (1) From the Revolution to the War of 1812; (2) from the War of 1812 to the Civil War; (3) from the Civil War to the last decade of the 19th century; (4) from about 1890 to the present time. These periods are somewhat overlapping but while not exactly defined will prove convenient for a study of the growth of State activity. The first period may be characterized as that in which the legislature was supreme. The legislature, historically the guardian of popular rights against the British government, continued to be regarded as the best and safest repository of power. The strong colonial executive was replaced by a governor having very slight administrative duties and even less discretionary power. He was elected by the legislature in most of the States, had the veto power only in Massachusetts and was unable to adjourn, prorogue or dissolve the legislature. The constitutions were based upon a belief that the people had nothing to fear from the legislature, but that they should be safeguarded against the executive and judiciary.

The second period experienced most far-reaching political and social changes in the United States. Democracy was everywhere triumphant and American political institutions, including State constitutions, were very thoroughly democratized. The earlier period placed marked limitations upon the privilege of voting, while the second nearly everywhere granted manhood suffrage to whites. State governors and judges were generally elected and the judicial term was shortened. The governor began to acquire the veto power. The confidence reposed in the legislature had been, in a sense, misplaced. In the early part of the second period there was much reckless management of the finances, money was squandered on the most chimerical schemes for internal improvements, charters were granted for banking institutions that had little or no capital, special legislation of the worst sort was passed, monopolies were created, appointments controlled, unmerited exemption from taxation was voted, and laws were even passed for the purpose of affecting cases pending in the law courts. The day of reckoning came in 1837 and since that time there has been

a constant tendency to check and limit the powers of the legislature. The revolutionary practice of adopting constitutions in State constitutional conventions, without ratification by popular vote, gave place to the direct reference of constitutions and their amendments to the people at the polls. The desire to narrow the field of legislative competence was further evidenced by the adoption of amendments limiting its authority over specified fields. Few important changes in the principles of State constitutional law took place before the Civil War. The chief improvements were of an administrative character.

The Civil War, which marks the beginning of the third period, brought about a radical readjustment of economic and industrial conditions throughout the United States, and, in addition, effected a complete change in political conditions in the Southern States. The predominant characteristic of this period has been a continued and increasing distrust of the State legislatures, which has resulted in very marked limitations of their powers. These have been effected chiefly in two ways. First, the field of legislative activities has been decreased by prohibiting the passage of certain laws or classes of laws; by direct legislation by means of constitutional amendments in matters formerly controlled by the legislature; and by requiring popular approval, at the polls, of certain legislative measures, before they can be enacted as laws. Second, the powers of the governor and judges have largely increased. The governor's term which was, at first, annual in all but three States, has been greatly lengthened and is now annual in one only, while over half the States have a four-year term. His power has been further enhanced at the expense of the legislature by an almost universal grant of the veto, only one State withholding this power and 34 granting, in addition, the power to veto items of an appropriation bill. The States of Washington, South Carolina and Virginia even allow the executive to veto items of any bill and the governor of Pennsylvania can approve such portion of an item of an appropriation bill as he sees fit. The executive appointing power has been materially augmented and the power to pardon and reprieve has been nearly everywhere granted. These changes are indicative of a growth in the confidence placed by the people in the governor, which is the most important source of his increased power. This confidence has been engendered by the fact that responsibility can be fixed upon the single executive, as it cannot be upon the legislature, which is, under our American system, without responsible leadership. The judicial office, although based in a large majority of cases upon popular election, has had its term materially increased in this period.

The fourth period may be said to date from the last decade of the 19th century. It is marked by a conspicuous tendency to enlarge the functions of the State and to extend the activities of State governments over vast ranges of human activity which were formerly left entirely to the individual or to the individual restrained only by the courts from encroachment upon the rights of other individuals and by a wide extension of the use of ultra-democratic machinery of political control, such as initiative, referendum and, to a lesser decree, recall.

Socialization and democracy have gone hand in hand; the former adding new and enlarging old State activities and the latter providing a more direct and intimate control of government by the people themselves. The magnitude of the vast business and social interests committed to State departments and to State administrative boards and commissions has made a trained personnel a necessity. Commendable progress has been made in the direction of a permanent civil service in many States, although the old idea that to the victor belongs all the spoils dies hard. A better appreciation of the value and necessity of the expert in administrative positions is manifesting itself, although the average American still greatly underestimates experience and training as assets in the art of government. Many students of politics believe that betterment in administration is accomplishing more for good government than are legislative and constitutional reforms.

Direct popular control of legislation may be divided into three classes: First, measures referred by a representative body, either a constitutional convention or a legislature; second, measures passed by a representative body and then upon popular petition submitted to the people at the polls for final action; and third, measures referred to the electorate for adoption after initiation by a certain proportion of the voters. The first class, commonly called compulsory referendum, deals largely with constitutional amendments. In a few cases, the submission of certain classes of statutory enactments, such as State bond issues, is compulsory. The first class has greatly exceeded the others, thus far, in number, but in the last decade the practice of popular initiative has rapidly increased. The popular vote in a compulsory referendum averages less than 50 per cent of the total vote cast at the same election, while measures submitted as the result of popular petition or initiative attract a considerably larger vote. Apprehension that initiative and referendum would result in increased radicalism has not been justified. The people have, on the whole, voted intelligently and more conservatively than their legislatures. Every State in the Union, except Delaware, has compulsory referendum of constitutional amendments. About a quarter permit initiation of amendments by petition and nearly one-half allow popular statutory initiative in some form. Massachusetts and Michigan grant to their legislatures the privilege of submitting statutory measures to popular referenda for final adoption. Initiative and referendum have been tried long enough to prove both their value and their limitations. Restricted to few and fundamental enactments dealing with general principles their use is decidedly effective in securing a real popular control of government. Indirectly they have tended to make legislative action more responsive to public opinion and more carefully considered. Applied to numerous and detailed measures, the system breaks down under its own weight. It can only supplement and not supplant the work of the State legislature.

The third of these measures of democratic control of State government, the recall of

elected officers, has been adopted in slightly less than one-fourth of the States and has been very rarely used for State officers and somewhat more frequently for local. The very general lengthening of the terms of elective officers made recall a logical feature of the program of real control of government by the electorate. Its adoption was in response to the demand of a democracy for the same effective control over men which the initiative and referendum gave over measures. Its value lies rather in its potential than in its actual use.

The recall of judicial decisions, demanded by the more radical advocates of popular control, has not met with general favor.

The lack of confidence in the legislature which characterized the third period continued throughout the fourth, another evidence of which is the limitation of the time during which the legislature can sit. This has been accomplished by decreasing the frequency and by limiting the duration of the sessions. Public opinion has traveled far from that of the Revolutionary period, which was expressed in the so-called axiom of political science: «Where annual sessions end tyranny begins.» Six States only, and all of them of the original 13, retain annual sessions. Alabama, in her recent constitution, has prescribed a quadrennial session. Nearly half of the States limit the duration of the session to from 40 to 90 days, and others accomplish the same end by cutting off the pay of the legislature at the end of a similar period. This attitude of the people is further shown by numerous constitutional provisions adopted for the purpose of preventing the railroading and fraudulent passage of bills, especially during the closing days of the session. For example, in New York, no bill may be passed or become a law unless it is printed and lies, in its final form, for at least three calendar legislative days upon the desks of the members, unless the governor certifies to the need of its immediate passage; and no amendment is allowed on the last reading of a bill. Other provisions attempt to prevent or punish bribery and make impossible the appointment of a legislator to any civil office during the term for which he is elected.

The rapid growth of State debts during the half century preceding 1870 was another cause of great dissatisfaction with the legislatures The total State indebtedness in 1825 was $12,790,728; in 1870 it had risen to the portentous sum of $352,866,898. Drastic measures were taken by a large number of States to prevent further squandering of the people's money by their representatives, with such success that the total of State indebtedness was reduced to about $172,000,000 in 1904, since which time there has been only a small total increase save in the States of New York and Massachusetts where bond issues for canals and for highways have enlarged their combined debt to an amount of approximately a quarter of a billion. Most States forbid the legislature to contract debt for more than a maximum amount fixed by the constitution. (For example, $50,000 in Oregon; $1,000,000 in Pennsylvania). New York State allows the legislature to issue deficiency bonds, not to exceed $1,000,000, and to contract debt for the purpose of repelling invasion or of suppressing insurrection, but for all other purposes the approval of the voters is necessary before a loan can be contracted. Moreover, nearly every State requires that a sinking fund be established for every bonded loan issued.

This distrust of the legislature is traceable to several causes. State legislation has been frequently hasty and ill-advised. In New York from 1895 to 1904 the courts pronounced 41 laws, passed by the legislature, unconstitutional. Special legislation has engrossed the attention of the legislators and has often been so obviously opposed to the general welfare that public opinion has imputed the worst of motives to the members. The people are convinced that the party «boss» controls the legislature, the members of which merely register his will; and that he orders measures passed for partisan or corrupt purposes. The second of these reasons is unquestionably the most influential. A vast majority of the laws passed in the average legislature concern local or special interests. Eight typical States, in 1901, passed a total of 7,032 statutes, of which 5,876 were of local or special import. The objections to this class of legislation are two-fold. First: the time and interest of the members are so largely occupied with the work of obtaining legislative favors for political and personal friends that insufficient time and attention are given to bills of a general character whose effect upon the private or political fortunes of the legislators may not be so intimate. Second: Special legislation, particularly for corporate interests, gives ample opportunity for bribery and corruption, which, although doubtless not so great as is often charged, is commonly believed by public opinion to be associated with the passage of such measures. Perhaps an even greater evil is the constant changing and amending of city charters and other local government laws in the interests of the «boss» or party which controls the legislature, or of influential public service corporations. Sometimes an entire city government has been legislated out of office, as in the Pennsylvania «Ripper» Act of 1902. To check this abuse, 39 States have adopted constitutional provisions forbidding special or local legislation. These provisions vary greatly. Some of them are very sweeping and stringent and others have not been carefully enough draughted to prevent the continuance of the practices they were intended to abolish. The most common of these provisions require incorporation under a general law; proscribe legislative auditing of private claims; prohibit exemption from taxation, except under general laws; forbid the passage of acts, except as general laws for the chartering and government of cities and towns and, in the realm of purely private law, interdict legislative divorce and legislative admission to the bar.

The result of the presence, in the constitution, of this great mass of matter, either directly or indirectly restrictive of the powers of the legislature, has been to abolish the distinction in character which formerly existed between constitutional and statute law, and to incorporate in the body of supposedly fundamental law details that more properly belong in a statute or even in an administrative ordinance and thus enormously to increase the size of the constitution. It must be remembered that the State legislature is not, like Congress, a body exercising only delegated powers. Any power within the competence of the State it can legis-

late upon, unless forbidden by the constitution; hence any limitation of its power must be expressly stated in the constitution. This is the reason why distrust of the legislature has caused such an increase in the size of our State constitutions.

The frequent and lengthy additions to our State constitutions are themselves a fruitful source of further amendment, for the more elaborated the fundamental law is in a growing civilization the more frequent will the changes be. Dealing, as they do, often in minute detail, with a large range of subjects, constant revision is necessary to remedy defects and to meet the needs imposed by changing conditions. The New Hampshire constitution of 1776, excluding the preamble, contained 600 words; the constitution of Oklahoma contains nearly 50,000 words.

Constitution making has been most active in the West and South. Economic and social changes have been the chief causes in the West, while in the South the Civil War and the successive attempts at a settlement of political problems have occasioned the frequent adoption of entirely new constitutions. Massachusetts has lived, since the Revolution, under the constitution of 1780; but several of the Southern States have adopted five and six entirely new constitutions in addition to numerous amendments. Nine new constitutions were adopted, and two were rejected, during the period from 1890 to 1903, and in the shorter period from 1895 to 1903 284 amendments were proposed and 168 adopted. An average of about 50 amendments per year has been maintained during recent years. Practically every State has made some change in its constitution within the last 10 years.

The method of amendment varies in the different States. The practice of submitting fundamental law to the voters for adoption had been almost universally in vogue, except in the Confederate States, for about three-quarters of a century before 1890, but while the North and West still make this method obligatory, six Southern States, largely influenced by the negro problem, promulgated new constitutions by act of the constitutional convention without popular ratification. In all but 12 of the States constitutional provision is made for calling conventions for the purpose of general revision of the constitutions. The legislatures in most of these States, if their action is supported by the voters at the polls, can call conventions. Several make obligatory the submission to the people, at stated intervals (N. Y., Md., Okla., Ohio, 20, Mich., 16, Iowa, 10 and N. H., 7 years) of the question whether a convention is desired or not. Every State, save New Hampshire, makes provision for ordinary amendment by legislative initiative and in all of these, except Delaware, by submission to the voters for ratification. Twelve States allow the initiation of constitutional amendments by popular petition, signed by a fixed per cent of voters, which varies from 5 to 25 per cent but averages about 8. In Delaware only, is the legislature, acting by two-thirds majorities for two successive sessions, competent to adopt a constitutional amendment without popular vote. South Carolina and Mississippi have the unique method of requiring an amendment, which has been proposed by two-thirds of each house of the legislature and approved at the polls, to be further ratified by a majority of each house at the next legislature. Thirty-two States allow one legislature, generally by a two-thirds or a three-fifths vote of each house, to propose amendments. In 10, two successive legislatures must each adopt the proposed amendment before submission to the people. A majority of votes cast is sufficient for adoption in 33 States. Rhode Island requires a majority of three-fifths and New Hampshire two-thirds of the votes cast, while Missouri and Wyoming prescribe a majority of all the voters of the State. Ten other States have slight modifications of the rule requiring a simple majority of the votes cast for the amendment. Delaware it will be remembered does not refer amendments to the electorate.

After the grant of the franchise to the negro during reconstruction, the ideal of manhood suffrage was very nearly attained. Recent years, however, have shown a tendency to restrict the franchise save in the matter of woman suffrage. Seven of the Southern States have adopted restrictions (six of them constitutional), which were primarily designed to deprive the negro of the right to vote and which have, in spirit at least, annulled the 15th Amendment. Even when the race problem is not involved, there is a tendency to place a higher value on the elective franchise. An increasing number of States are restricting the privilege to citizens of the United States (only seven now permit aliens to vote), and a number of recent constitutions have imposed the qualification of ability to read and write English. In all, 16 States have an educational qualification, in several alternative with a property qualification.

One of the most remarkable of political phenomena of recent years has been the rapid spread of the woman suffrage movement. Wyoming, in 1890, was the first State to establish full suffrage for women. Four other States followed her in the 19th century, but for over a decade no further addition was made to the list of suffrage States notwithstanding extraordinary efforts at propaganda. In 1911 California conferred the franchise on women and within three years five other States joined the column of equal vote States. At the present writing women have won the right to vote at all elections in 12 States and possess limited suffrage in many more. Moreover both of the great national parties have declared for woman suffrage and a Federal suffrage amendment has been passed by the necessary two-thirds vote of both houses of Congress and is now before the States for their adoption or rejection. See WOMAN SUFFRAGE.

The typical State constitution contains: (1) A definition of boundaries, except in the older States; (2) A bill of rights; (3) A frame of government; (4) A great mass of miscellaneous provisions, arranged with slight regard for logical classification, "relating to administration and law, including articles treating of education, of the militia, of taxation and revenue, of the public debts, of local government, of State prisons and hospitals, of agriculture, of labor, of impeachment and of the method of amending the constitution, besides other matters still less political in their character"; (6) The schedule, which contains temporary provisions about putting the constitution into effect.

A bill or declaration of rights, historically

the most important part of the document, is found in every State constitution, except Michigan's, where there is no separate bill of rights. It contains those fundamental guarantees of personal liberty, the most prized heritage of our race, which are most familiar through incorporation in the Federal Constitution, and in addition many provisions, widely dissimilar in the several constitutions, defining supposedly inherent rights of the individual. The bill of rights of the Federal Constitution restricts the Federal government alone; hence the necessity for the incorporation of a bill of rights in the State constitution. Mention will be made of one only of the rights thus secured to the citizen. Religious liberty, in its fullest sense, was not a possession of all people in the American States during the early years of national independence. Connecticut did not abolish her established church until 1818 and that of Massachusetts was not fully disestablished until 1833. At the present time all States have constitutional guarantees of freedom of conscience, of expression of religious opinion, of worship or of non-worship and of equality of all religious denominations in the eyes of the law; although the Christian religion is by the common law recognized as the prevailing religion of the country, as is witnessed by the laws of blasphemy and of observance of the Christian Sabbath.

The frame of State government is strikingly similar throughout the Union. Each provides for an executive department consisting of a governor, a lieutenant-governor in most States, and heads of the important departments of administration (secretary of state, treasurer, comptroller, attorney-general, etc.), elected in nearly all of the States and constituting, with the governor, what is in reality an executive in commission. While in the Federal government the President is *the* executive, the State governor is merely a part of the executive; a number of the most important heads of departments being nearly or quite independent of the governor, although in some States subject to removal from office for cause shown. They are practically colleagues, not subordinates, of the governor. Executive decentralization is the rule; a rule still further enforced by the creation of large numbers of administrative boards and commissions, all of which are created by law and have their duties prescribed by the legislature and, whether appointed by the governor or not, are in practice very little under his control. A number of State governors have, in recent years, called attention to the defects of such excessive decentralization and have asked the legislatures to devise remedies for what they deem a growing evil. The governor's power of appointment is in most States small and his actual control of administration is even less. His greatest legal power and responsibility are derived from the possession of the veto and the marked increase in recent years in the influence of the gubernatorial office has been due to the fact that its incumbent is the elected representative of all the people and hence has their confidence and is the exponent of public opinion to a far greater degree than the legislature and to the governor's share in legislative power rather than to his executive and administrative functions.

The legislature is everywhere bicameral. Two houses exist because the American people believe that the bicameral system embodies a sound principle of political science and not because special classes, or elements of the body politic, can thereby obtain a share in government. The essential difference, an artificial one, is that the senate, as the smaller body, represents a larger number of voters who possess the same voting qualifications as the electors for the lower house.

The democratic principle of representation in proportion to population may be regarded as the established American State policy, although there are numerous departures from the strict rule and in a few States gross violations of the principle allow the existence of a *rotten borough* system comparable to that of England before the Reform Act of 1832. In many of these States the former historic unit of representation, the county or town, is retained partly for partisan purposes and partly to protect a minority, usually rural, against an industrial and urban majority. The constitutions of 18 States provide adequately for proportionate representation in both houses. In the remaining 30 States there are modifications of the rule for one or both houses, of which the most common is that each county (or town) shall have at least one representative. However, these exceptions are grossly inequitable in some six or eight States only, nearly all of them among the original 13.

Although over one-half of the States give the initiation of money bills to the lower house, there is no sufficient reason for such discrimination. The practice is a survival of colonial custom or is a meaningless copy of Federal or English precedent. In other matters the powers of the two houses are in general identical, except in the process of impeachment and that in some States the senate has the power of confirming executive appointments. The committee system, modeled closely after that of Congress, is everywhere in use and rules and procedure are practically the same as the Congressional. The governor and heads of departments never occupy seats in the legislature and the English system of government through a premier, who is responsible to a Parliamentary majority, has never found lodgment in the United States.

The organization of the judicial department varies somewhat in the several States, although the difference is rather in the degree of development than in the principle of organization. Most States have at the head of their system a single court of appellate jurisdiction called, generally, the Supreme Court, sometimes the Court of Appeals; and a Superior or Circuit Court of highest original jurisdiction. Lower courts consist of county and local courts of inferior jurisdiction. In New York, whose judiciary may be taken as an example of more highly organized systems, which obtain in some of the larger States, the State courts consist of a Court of Appeals, four appellate divisions of the Supreme Court, with justices assigned from the Supreme Court, and the Supreme, really a District, Court of numerous judges, County Courts, except in New York County, and courts of the justice of the peace. The cities of the State have special Municipal Courts. In counties having a population of 40,000 or over there is a separate Surrogate's Court for probate jurisdic-

tion. Separate chancery courts, which were found in nearly all of the original States, were regarded as inconsistent with the democratic spirit of the age and now exist in a few only of the older commonwealths. Equity jurisdiction is, however, administered in all of the other States by the regular judges of the law.

Georgia was the only revolutionary State to vest the election of judges with the people. Six gave the choice to the legislature and in the remaining six the governor, with the consent of the council (in Delaware of the legislature), made the appointment. The strong democratic wave which swept over this country in the early part of the 19th century affected the judicial office by very generally transferring the election to the people and by adopting a short term in place of the life tenure of the early period. There are now 37 States which vest the election of the higher judges in the people, while minor judges are even more generally elected. The governor appoints in six States, subject to the approval of the council or senate. In Connecticut, the governor nominates and the legislature elects. In Rhode Island, Vermont, Virginia and South Carolina the legislature both nominates and elects the judges. Massachusetts, Rhode Island and New Hampshire (until 70 years of age) alone retain life tenure. The term in Pennsylvania is 21 years, in Maryland and Virginia 15, and in New York 14. Vermont has the shortest term, two years, while the average is from six to eight years. Judicial salaries have been considerably increased of late, but in many States are still altogether too low to command the best or even thoroughly qualified men. They range from $2,500 in Vermont to $17,500 for Supreme Court judges in New York City, which is the highest judicial salary paid in America. The average for Supreme Court judges is about $5,000. In somes States judges are removable by impeachment, in others by an address of both houses of the legislature to the governor, a two-thirds vote generally being necessary and in a few by a two-thirds vote of the legislature.

The local government divisions of the State are the creation of the legislature, which, unless expressly restrained by the constitution, can make and change them as it pleases. Legally they are political divisions erected by the legislature for the purpose of assisting in the government of the State. Historically the principle of local self-government lies deeply embedded in our political life and this fact has been recognized in numerous recent constitutional enactments, which limit the hitherto unrestricted control of local government by the legislature. A dozen States give cities and in some cases counties the right to frame their own charters.

Among the numerous miscellaneous provisions of the modern State constitution several deserve especial mention. Formerly education was a purely local concern, but the increasing recognition of the political importance of education in a democracy has led the State to grant extensive aid and to assume a large degree of control. Practically all of the States now have a State superintendent or commissioner, generally elected and nearly always a constitutional officer, and State boards of education. All but a few of the older States, in addition to financial assistance to primary and secondary schools, maintain State universities. So vital is the subject considered that the people embody the most important regulations in the constitution. Even the revenues for the support of the universities are usually secured beyond the chance of hostile legislation by a constitutionally fixed rate of taxation.

The growth of great transportation and industrial corporations in recent years has been the cause of a vast amount of restrictive and regulative legislation. Popular fear of the railroad combination and of the industrial trust and distrust of the legislature as an efficient and incorruptible agent for dealing with capitalistic monopolies have led the voters in many States to incorporate provisions in their constitutions forbidding the combination of competing railroad and telegraph lines, while a multitude of anti-combination laws have been passed by the remaining States. The lack of power to regulate interstate commerce has made most of these efforts at control of transportation ineffective and a demand for more effective Congressional legislation has consequently arisen. Anti-trust agitation has been so widespread that a large majority of States have now passed laws against trusts and of these about one-half have anti-trust clauses in their constitutions. Nearly all of the States have provisions against monopolies, either in constitution or statute, and every State of the Union has found the regulation of corporations necessary. The subject of corporation control has aroused more interest than any other State question that has been before the American people since the era of reconstruction. Even in the recently adopted Southern constitutions, the control of corporations was second only to the disenfranchisement of the negro as an object of popular desire.

Administrative boards or commissions, with administrative, ordinance-making and even quasi-judicial powers for the effective regulation of public utilities and in some cases of vital industries are found in nearly every State. Public opinion tends to regard the extension and intensification of this means of control and regulation as the most promising method of safeguarding public interest against the evils resulting from powerful corporations.

Labor legislation has begun to find expression in State constitutions, although the problem is still very largely a matter of regulation by statutes. Provisions regulating hours, conditions of employment, especially of women and children; authorizing a minimum wage; establishing labor bureaus, boards, commissioners and arbitration courts and modifying in the interest of the wage-earner some of the old common-law principles, such as the fellow-servant rule, have made their appearance here and there in State constitutions.

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42. IMMIGRATION (1789–1916). The causes which operated before the Revolution to bring a small stream of European emigrants to the United States continued to operate after the establishment of the Federal government. Though no trustworthy records were kept in the early history of the republic, it is estimated that from 1783 onward the number of immigrants to this country was about 4,000 a year till 1794, when, as a result of the French-English war, the number was increased to 10,000. After that date it dropped to about 6,000 a year till 1806, when, as a natural result ot the British and French Continental blockades and of the American Embargo, it was reduced practically to nothing for the next 10 years. Then, beginning with 1816, the passenger arrivals, including returned Americans, reached about 8,000; and in the following year the number bounded up to 22,240. The large number of immigrants flocking to the country about this time produced considerable hardship incident to overcrowding. At this juncture the first legislation concerning immigrants was enacted by Congress, which simply provided that a record should be kept of the number of passengers in each customs district, registering the sex, age, occupation and country of birth. Since the government encouraged immigration as increasing the wealth and developing the resources of the country, this act of March 1819 was not in the nature of a restriction, but was intended merely as a record of the arriving aliens. Accordingly, from 1 Oct. 1819, an account has been kept at all the customs ports of the number, sources and conditions of all immigrants to the United States. The record will be found in the accompanying table.

IMMIGRATION TO THE UNITED STATES BY YEARS.

Year ending 30 Sept.	
1820	8,385
1821	9,127
1822	6,911
1823	6,354
1824	7,912
1825	10,199
1826	10,837
1827	18,875
1828	27,382
1829	22,520
1830	23,322
1831	22,633
1832 (to 31 Dec.)	60,482
1833 (Jan. to Dec.)	58,640
1834	65,365
1835	45,374
1836	76,242
1837	79,340
1838	38,914
1839	68,069
1840	84,066
1841	80,289
1842	104,565
1843	52,496
1844	78,615
1845	114,371
1846	154,416
1847	234,968
1848	226,527
1849	297,024
1850	310,004
1850 (1 Oct. to 1 Dec.)	59,976
1851 (Jan. to Dec.)	379,466
1852	371,603
1853	368,645
1854	427,833
1855	200,877
1856	195,857
1857 (to 30 June)	112,123
Year ending 30 June	
1858	191,942
1859	129,571
1860	133,143
1861	142,877
1862	72,183
1863	132,925
1864	191,114
1865	180,339
1866	332,577
Year ending 30 June	
1867	303,104
1868	282,189
1869	352,783
1870	387,260
1871	321,350
1872	404,806
1873	459,803
1874	313,339
1875	227,498
1876	169,986
1877	141,857
1878	138,460
1879	177,826
1880	457,257
1881	669,431
1882	788,992
1883	603,322
1884	518,592
1885	395,346
1886	334,203
1887	490,109
1888	546,889
1889	444,427
1890	455,302
1891	560,319
1892	479,663
1893	439,730
1894	285,631
1895	258,536
1896	343,267
1897	230,832
1898	229,299
1899	311,715
1900	448,572
1901	487,918
1902	648,743
1903	857,046
1904	812,870
1905	1,026,499
1906	1,100,735
1907	1,285,349
1908	782,870
1909	751,786
1910	1,041,570
1911	878,587
1912	838,172
1913	1,197,892
1914	1,218,480
1915	326,700
1916	298,826
Total	32,652,950

It is to be noted: first, that up to 1856 the record includes all "alien passengers arrived," and does not distinguish immigrants from passengers, so that a reduction must be made from the total; second, that the immigration overland from Canada and Mexico is not included in these figures. For example, in the census of 1900 Canada is given as the birthplace of 1,183,255 persons, and Mexico as 103,445. An examination of the table reveals the fact that the record shows several well-defined periods, with notable fluctuations. The first period extends from the beginning to 1826, inclusive, when the maximum seems to have been about 10,000 (reached in 1794, 1825 and 1826). The second period extends from 1827 to 1831, when the maximum is 27,382, the average being more than. double that of the first period. This increase is perhaps explained by the enormous influx of Europeans to this country as the natural result of the wretched industrial conditions in Europe during the time of the Holy Alliance. The third period includes the decade from 1832 to 1842, when the tide of immigration is trebled or quadrupled, save a considerable ebb in 1838 due to the panic of the preceding year. After this period, when steamboat navigation and railroads began to render the fertile plains of the West accessible, such abnormal conditions as the Irish famine and the California gold discoveries sent immigration up by leaps and bounds till 1854. The flood of immigration that swept over the country during these years, demoralizing politics, trade and industries of all sorts, gave rise to the anti-foreign agitation; and this combined with the business depression of 1857 and the Civil War, which followed soon after, to reduce the number of immigrants greatly. However, after the war when the country entered upon a new era of industrial enterprise offering an almost boundless field for laborers, the tide of immigration again rose rapidly till 1873, when, under the influence of the panic and the hard times that followed, it once more receded. But, with the revival of business in 1880, foreigners again flocked to our shores in larger numbers than ever before, and immigration reached a

highwater mark (669,431) in 1881. Since that year there has been a steady stream pouring into the country, save during the period of business depression from 1894 to 1898. In 1905, 1906, 1907 and again in 1910, 1913 and 1914 the number of immigrants exceeds the million mark.

Most of the early immigrants came from Great Britain, a fair number from Germany, but very few from other European countries. In 1850 Great Britain furnished about 60 per cent of the immigrants and Germany 584.000, or 36 per cent. Thus 96 per cent of the immigrants in 1850 were of Teutonic blood, with the Anglo-Saxon element predominating. The proportion was very much the same in 1860. But in 1870, while the totals were much larger, the British percentage was falling and that of the other foreign elements was increasing. In 1880 the British contingent, including the Canadian, though larger in the grand total than before, had dropped to 47.5 per cent, the German to 30, but a considerable new element had arrived of Bohemians, Poles, Scandinavians, Italians and Russians. In 1890 the British contingent had fallen to 29 per cent, or 2,700,000; the German increased to 33 per cent, or 3,000,000; while the number of Poles, Russians and Bohemians in the country amounted to 450,000, the Italians to 182,500 and the Scandinavians to 933,000. In 1900 the Slav element had reached 1,000,000, or nearly 10 per cent of the foreign-born population of the country, the Scandinavian over 1,000,000, the French including French-Canadian 500,000, the Italian nearly 500,000, the Mexican over 100,000, while the British had sunk to 19.4 and the German to 14 per cent. Since 1900 the Teutonic element has diminished considerably while immigrants from the countries of southern and eastern Europe have flocked in overwhelming numbers to our shores. Of these the Italians and Poles have been in the preponderance. The following table shows the racial groups of immigration by decades:

IMMIGRATION TO THE UNITED STATES, ARRANGED BY NATIONALITIES AND DECADES.

COUNTRY	1831–40	1841–50	1851–60	1861–70	1871–80	1881–90	1891–1900	1901–10	1911–15
Austria-Hungary	.....	.....	.....	7,800	72,969	353,719	597,047	2,145,266	889,427
Belgium	22	5,074	4,738	6,734	7,221	20,177	20,062	41,635	25,447
Denmark	1,063	539	3,749	17,094	31,771	88,132	52,670	65,285	29,798
France	45,575	77,362	76,358	35,984	72,206	50,464	36,006	73,379	40,432
Germany	152,454	434,626	951,667	787,468	718,182	1,452,970	543,922	341,498	137,711
Greece	.....	.....	.....	.....	.....	.....	15,996	167,519	118,916
Italy	2,253	1,870	9,231	11,728	55,759	307,309	655,694	2,045,877	938,984
Netherlands	1,412	8,251	10,789	9,102	16,541	53,701	31,816	48,262	31,344
Norway	} 1,201	13,903	20,931	109,298	211,245	568,362	{ 95,264	190,505	47,527
Sweden							{ 230,679	249,534	72,055
Russia (Russian Poland)	646	656	1,621	4,536	52,254	265,088	593,703	1,597,306	894,003
Spain	} 2,954	2,759	10,353	8,493	9,893	6,535	{ 6,723	27,935	27,921
Portugal							{ 23,010	69,149	48,580
Rumania	.....	.....	.....	.....	.....	.....	14,559	53,008	11,187
Switzerland	4,821	4,644	25,011	23,286	28,293	81,988	33,149	34,922	17,020
Turkey (in Europe)	.....	.....	.....	.....	.....	.....	2,562	118,202	73,741
United Kingdom:									
England	73,143	263,332	385,643	568,128	460,479	657,488	271,094	388,017	193,623
Scotland	2,667	3,712	38,331	38,768	87,564	149,869	60,053	120,469	62,944
Ireland	207,381	780,719	914,119	435,778	436,871	655,482	403,496	339,065	121,740
Wales	.....	.....	.....	.....	.....	.....	11,186	17,464	10,250
Total Europe	495,688	1,597,502	2,452,657	2,064,407	2,261,904	4,721,602	3,703,061	8,136,016	3,795,797
Total America	33,424	62,469	74,720	166,597	403,726	426,523	42,659	361,808	528,098
China	8	35	41,397	64,301	123,201	61,711	23,166	20,605	10,499
Japan	.....	.....	.....	.....	.....	.....	26,855	129,797	36,400
Turkey (in Asia)	.....	.....	.....	.....	.....	.....	8,398	77,393	72,231
Other Asia	40	47	61	308	622	6,669	28,396	15,772	4,479
Total Asia	48	82	41,458	64,609	123,823	68,380	86,815	243,567	123,719
Total Oceania	9	29	158	221	10,913	12,574	8,793	12,973	6,126
Total Africa	52	55	210	312	229	437	1,343	7,368	5,847
All other countries	69,801	52,777	25,921	15,232	1,540	1,299	1,749	33,654	200
Grand total	599,125	1,713,251	2,598,214	2,314,824	2,812,191	5,246,613	3,844,420	8,795,386	4,459,800

Several laws have been passed by Congress, designed to prevent certain evils of indiscriminate immigration. Among those evils may be mentioned the immigration of criminals, paupers, contract laborers, diseased persons (whether in mind or body), and such other persons as are unable to support themselves. Such persons, according to the laws enacted from 1882 to 1893, are not permitted to enter the United States, and the steamship companies bringing in such immigrants as are rejected under these acts are required, at their own expense, to transport them back to the countries whence they came. The following table shows the number of undesirable aliens debarred and deported during the years 1905–16:

ALIENS DEBARRED AND DEPORTED FROM 1905 TO 1916.

YEAR	Debarred	Deported	Total number of immigrants
1905	11,879	845	1,026,499
1906	12,432	676	1,100,735
1907	13,064	995	1,285,349
1908	10,902	2,069	782,870
1909	10,411	2,124	751,786
1910	24,270	2,695	1,041,570
1911	22,349	2,770	878,587
1912	16,057	2,456	838,172
1913	19,938	3,461	1,197,892
1914	33,041	4,610	1,218,480
1915	24,111	2,670	326,700
1916	18,867	2,906	298,826

In 1864 Congress passed the first immigration act, which was designed to promote, not to restrict, immigration; but this act was repealed in 1868. In 1882, the year after immigration reached the unprecedented mark of 669,431, Congress enacted the first restrictive law debarring criminals, paupers, insane and

other undesirable classes, as indicated above, and imposed a head tax of 50 cents on all aliens entering the United States. This head tax, by subsequent acts of Congress, was increased successively to one, two and four dollars. In 1885 a more drastic act was passed, which was intended to exclude contract laborers and strike-breakers and persons of the baser sort. But this act did not operate as successfully as was expected; for it debarred the better classes of immigrants, such as artists, architects, musicians and even clergymen, along with the undesirable classes which it was especially intended to exclude. It was, therefore, amended, in 1891, so as not to militate against such classes of immigrants as should be encouraged.

In 1888 and 1892 Congress passed enactments debarring such immigrants of alien race as, for any reason, refuse to assimilate with our natives. This measure was directed specifically against Chinese immigrants and was intended to prohibit Chinese laborers from entering the United States. The law was the natural outgrowth of the constant labor agitation and the earnest appeals from the Pacific Coast for relief from the vast hordes of ignorant and immoral Chinese flocking to our shores.

In 1903 more drastic legislation was enacted, which requires a preliminary inspection of intending immigrants at the point of departure and gives the government the right to deport, within two years after arrival, any immigrant landed in violation of this special act.

In 1906 Congress legislated into being the present Bureau of Immigration whose duty it is to keep a complete record of all aliens entering the United States.

In 1907 further restrictive legislation was enacted, which prohibits the bringing of women or girls into the United States for immoral purposes, such as prostitution. The immigration enactments of 1907, also, provided for a commission of nine persons consisting of three senators, three representatives and three persons appointed by the President, to investigate the whole subject of immigration and to report to Congress with recommendations.

This commission expired by limitation 5 Dec. 1910, and submitted a final report, in which they reached the unanimous conclusion that the time had arrived for taking steps for the radical restriction of immigration. The proposals of the commission for such restriction, as presented in this report, are as follows: (a) a reading and writing test; (b) the exclusion of unmarried unskilled laborers; (c) limitation upon the number of immigrants arriving at any one port and from particular races; (d) material increase of the amount of money in the possession of immigrants on arrival; (e) material increase of the head tax (now $2). The commission, moreover, made the following recommendations: 1. That for the protection of immigrants, government officials, both men and women, be placed on vessels carrying steerage passengers. 2. That the boards of special inquiry, which pass upon the appeals of would-be immigrants from adverse administrative decisions, should be composed of persons qualified to exercise judicial functions, that the hearings should be public and that an Assistant-Secretaryship of Commerce and Labor should be created to review appeals from the boards. 3. That the state should strictly regulate immigrant banks and employment agencies. 4. That the exclusion of Chinese laborers should be continued. 5. That no legislation regarding Japanese and Korean labor should be adopted so long as the present method of restriction is found effective. 6. That an understanding should be reached with the British government for the exclusion of East Indian laborers.

Of the foregoing propositions, the one providing for a reading and writing test attracted the widest attention both in and out of Congress. The American Federation of Labor urged the retention of the clause as the best method of excluding undesirable foreigners. On the other hand it was argued that its retention would exclude European agricultural workers who were every way desirable, but had lacked educational advantages.

A bill incorporating most of the recommendations of the above-mentioned commission was passed by Congress as designed to bring about the desired restriction of immigration, but because of its literacy test provision the bill was vetoed by President Taft in February 1913. During Wilson's administration Congress has passed two similar bills in 1915 and 1916, but these likewise have been vetoed by the President, for the same reason.

The European War greatly curtailed immigration to the United States as well as increased emigration to Europe. Thus the number of immigrants from eastern and southern Europe (Poles and Italians) was reduced to below the number from the Teutonic races of Europe. Of the total 298,826 immigrants in the year 1916, the principal contributing races were as follows: English, 36,168; Scotch, 13,515; Irish, 20,636; Italians, 38,814; Greek, 26,792; Scandinavian, 19,172; French, 19,518; Mexican, 17,198; Hebrew, 15,108; Portuguese, 12,208; German, 11,555; Spanish, 9,259; Japanese, 8,711; Dutch and Flemish, 6,113; Finnish, 5,649; Russian, 4,858; African, 4,576; Polish, 4,502; Cuban, 3,442; Bulgarian, Serbian, Montenegrin, 3,146; Chinese, 2,239; no other race in excess of 2,000.

The chief occupations of immigrants arriving in 1916 were as follows; professional (including teachers, engineers, artists, actors, clergy, etc.), 9,795; skilled labor of various sorts, 45,528; miscellaneous, 138,737, among which are included laborers (55,816), farm laborers (26,250), servants (29,258), merchants and dealers (7,017), farmers (6,840), agents (1,538), fishermen (741), manufacturers (315), hotel-keepers (243), etc. Those reporting no occupation, such as women and children, numbered 104,766 of the total number of immigrants (298,826).

Of the total alien immigrants admitted into the United States in the year 1916 (i.e., to 30 June, the end of the fiscal year), 141,390 entered through the port of New York; 12,428 through the port of Boston; 7,955 through the port of San Francisco; 4,029 through the port of Providence, R. I.; 3,896 through the port of Seattle, Wash.; 3,298 through the port of Honolulu, Hawaii; and smaller numbers through other ports. But it is significant to note that a large number of the alien immigrants in 1916 came into the United States

through the border stations, 100,366 entering through Canada and 16,520 through Mexico.

The destination of the alien immigrants admitted into the United States during the last two fiscal years is indicated by the appended table.

	1915	1916
Alabama	430	235
Alaska	693	550
Arizona	2,100	3,501
Arkansas	147	110
California	20,116	17,101
Colorado	1,339	1,119
Connecticut	6,620	6,788
Delaware	245	182
District of Columbia	1,087	728
Florida	4,810	3,634
Georgia	356	225
Hawaii	2,934	3,194
Idaho	1,226	1,012
Illinois	19,062	12,104
Indiana	2,146	1,866
Iowa	3,407	2,264
Kansas	744	696
Kentucky	268	129
Louisiana	1,451	913
Maine	4,401	6,766
Maryland	1,883	790
Massachusetts	27,482	30,814
Michigan	17,438	26,591
Minnesota	9,115	7,619
Mississippi	138	103
Missouri	2,743	1,746
Montana	3,454	4,123
Nebraska	1,388	921
Nevada	387	402
New Hampshire	2,832	3,737
New Jersey	11,284	8,369
New Mexico	561	418
New York	95,028	79,968
North Carolina	267	175
North Dakota	3,290	2,413
Ohio	9,341	8,796
Oklahoma	387	281
Oregon	2,629	1,882
Pennsylvania	24,596	17,369
Philippine Islands	16	20
Porto Rico	812	763
Rhode Island	3,621	4,589
South Carolina	132	73
South Dakota	1,095	786
Tennessee	306	146
Texas	9,447	13,288
Utah	1,296	1,168
Vermont	1,928	2,247
Virginia	855	1,003
Washington	13,093	9,978
West Virginia	2,030	2,168
Wisconsin	3,850	2,592
Wyoming	430	371
Total	326,700	298,826

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43. SUFFRAGE. Suffrage means participation in government by voting. There are two theories in regard to suffrage: (1) It is a privilege granted by the State to individuals; (2) it is a natural, inherent right belonging to every man. The former is the usually accepted theory; the latter, the outcome of the revolutionary movements of the 18th century, is today generally discredited. Suffrage in the English colonies in America was restricted as in England. Virginia began in 1619 with manhood suffrage, but in 1655 and 1670 restricted the suffrage to "free-holders and householders." Similar restrictions existed in the other Southern colonies and in the middle colonies. New England, notably Massachusetts and New Haven, had strict religious tests. Only "freemen" could vote and only members in good standing of some Congregational church could be "freemen." Consequently the majority of the male inhabitants were excluded, the entire list of "freemen" in Massachusetts between 1630 and 1691 numbering only about 2,000. When England secured better control over the New England colonies the suffrage was given to owners of estates valued at £40 or freeholds worth 40*s.* a year. During the 18th century the freehold test became general. Roman Catholic, Jews and, in New England, Quakers were generally disfranchised. There was also a moral qualification in New England — a voter must be "a person of civil conversation and quiet and peaceable behavior," not "an opposer of the good and wholesome laws of the Colony." In the South, no convict could vote. Each colony had its own naturalization laws until Parliament passed a uniform law (1746) requiring the Protestant faith and seven years of residence. The suffrage was extended very slowly, and when the Union was formed, in 1787, in each State it was very limited. The qualification was usually a freehold of 40*s.* to £3, or an estate worth £20 to £60, or ownership of a certain number of acres. It has been estimated that in 1787 there were in America 150,000 electors from a population of 5,000,000 which a hundred years later would have furnished 700,000 to 1,000,000 voters. The religious restriction soon disappeared,— last in South Carolina in 1797. Under the Constitution each State regulated its own suffrage. The influence of revolutionary theories upon politics had much to do with broadening the suffrage. In New England, where most men were white, the "rights of man" were believed in; in the Middle and Southern States, where blacks were numerous, the rights of white men alone were recognized. The new Western States offered citizenship on easy terms, thus stimulating the advance of democracy in the older States. Rival political parties wanted more votes, and all white men were gradually enfranchised. The last property test disappeared in Louisiana in 1845. The abolition agitation hastened enfranchisement of all whites by asserting the "rights of man." Before the Civil War only Connecticut and Massachusetts restricted white suffrage. Alarmed at the rapid increase of foreigners they enacted in 1854 and 1857 educational qualifications for voters.

Alternate educational or property qualifications exist in Connecticut (1874), Massachusetts (1856), Wyoming (1889), Maine (1891), and Delaware (1897). The payment of poll tax is now required in about half of the States, and in 20 States there is a direct or indirect educational test. The Federal government confers citizenship upon the alien by naturalization; the State confers the right to vote, subject only to the 14th and 15th amendments. In many States aliens have been allowed to vote after they have declared their intention to become citizens. Indians must become naturalized before voting unless permanently separated from the tribal organization, or living on their own property. As a result of recent war conditions absentee voting is provided for in several States, among which are Ohio, Oklahoma, Mississippi and Virginia. The tendency now seems to be toward requiring, as a qualification for voting, longer residence in the locality, registration to prevent frauds, American citizenship, and the payment of poll tax. The age at which a person otherwise qualified may

cast his first vote is, everywhere in the United States, placed at 21 years.

Negro Suffrage.—The extension of suffrage to negroes was a result of the Civil War. Prior to the Revolution, though there were no laws against it, it is not known that any negro ever voted in the New England or Middle colonies, but a few free negroes voted in Maryland, South Carolina and probably in North Carolina. Between the Revolution and the Civil War free negroes voted in several States. They were disfranchised in New Jersey, 1807; Maryland, 1810; Tennessee, 1834; North Carolina, 1835, and Pennsylvania, 1838. The elections of two Tennessee congressmen, John Bell and Cave Johnson, were decided by the ballots of free negroes. The agitation of abolition societies was the principal cause of the disfranchisement of free blacks. Vermont, Massachusetts, New Hampshire and New York alone before 1861 did not disfranchise them. The 13th Amendment (1865) to the United States Constitution merged the negroes into the political population for purposes of representation. A movement in the South (1867) to give the negro a limited suffrage was stopped by the Reconstruction Acts (1867) which gave the ballot to the negroes in the South, though as late as 1868 most of the Northern States gave them no political privileges. The 14th Amendment (1868), while disfranchising the prominent whites of the South, put a premium on the enfranchisement of the blacks by the State governments by offering increased representation in Congress. The 15th Amendment (1870) provided against discrimination on account of race or color and practically resulted in universal manhood suffrage. The amendments apply to the whole United States. Political corruption and misgovernment followed the enfranchisement of the negro, and from 1868 to 1876 the Southern whites were engaged in overturning the governments ruled by the negroes, thus beginning a thorough-going reaction against negro suffrage. From 1876 to 1890, the whites devoted themselves to destroying in the South the Republican party organization which controlled the negro vote. During this period the negro vote was restricted by centralization of the administration in Louisiana and North Carolina; by requiring the payment of taxes in Virginia, Arkansas, Georgia, Florida, Mississippi and Tennessee; and by complexity of election laws —Australian ballot system, registration, etc.— in Alabama, Arkansas, Virginia, Tennessee and Mississippi, amounting practically to an educational qualification. About 1890 began a movement to disfranchise negroes by changes in the State constitutions. Upon readmission to the Union (1868–70) a fundamental condition imposed was that their constitutions should never be revised so as to deprive any one of the right of suffrage. This condition was ignored by the Southern States and the amendments were evaded. The suffrage clauses in these new Southern constitutions are alternative: (1) the "understanding" clause requires the voter to be able to read or understand when read to him any section of the Constitution; (2) the "grandfather" or "old soldier" clause excuses from other tests those who have served in any war and their descendants, or those who were voters before 1 Jan. 1867, and their descendants; (3) a clause requiring a tax paying and property qualification from those disqualified under other clauses; (4) the "good character" clause requiring the voter to be of good moral character. Mississippi (1890) invented the "understanding clause," giving it to South Carolina, Alabama and Virginia; Louisiana the "grandfather" or "old soldier" clause (1898), giving it to North Carolina, Alabama and Virginia. Alabama (1901) discovered the "good character" qualification, passing it on to Virginia. Practically all the Southern States have a property and tax-paying qualification for voters, which, with the educational test, has since 1905 become the sole qualifications, although in Louisiana by constitutional amendment adopted on 5 Nov. 1912, the "grandfather clause" was revived for three months in order to provide for the registration of illiterate whites who failed to register in 1898. The evasive provisions are temporary, intended only to disfranchise the negroes, while including the whites. The effect of these restrictions is remarkable, disfranchising in each State that has restricted the suffrage from 30,000 to 60,000 whites and practically all the blacks. The tax-paying and registration requirements are now the most effective in excluding both whites and blacks. Regarding the conflict of these provisions with the United States Constitution and laws, the Supreme Court decided that the fundamental restriction imposed upon readmission of the States is unconstitutional, and that it is the duty of Congress to enforce the 14th and 15th amendments, which probably will not be done. In 1915 a crude form of the "grandfather" qualification in Oklahoma and Maryland was declared unconstitutional by the United States Supreme Court, but the decision did not affect the present situation in the South. The evil results from negro suffrage during Reconstruction caused Congress to hesitate before again interfering in affairs of the Southern States.

Suffrage in the Territories.— In the Territories suffrage is regulated by Congress, which may delegate its authority to the Territorial legislature. In the District of Columbia, white taxpayers voted from 1802 to 1855, when the suffrage was extended to all white men, and in 1867 to white and black males excepting Confederates and Confederate sympathizers. Misgovernment and corruption followed and in 1878 all voters in the District were disfranchised by Congress, local government now being carried on by a board of commissioners.

In Hawaii the right to vote is restricted to citizens of the United States who can speak, read and write English or Hawaiian. Thus most of the Chinese and Japanese, who are in the majority, are excluded for the present. In Porto Rico there is an educational qualification, and in the Philippines the voter must take an oath of allegiance to the United States and qualify either as a taxpayer or under an educational test.

Woman Suffrage.— The right to vote is rather a recent acquisition by women in the United States. They are said to have had the suffrage in Massachusetts, 1691–1780, and in New Jersey, 1776–1807, but it is not clear that they exercised the privilege. During the first half of the 19th century the extension of male suffrage, the better education of women, their prominence in church and mission work, and the renewed agitation in regard to "natural

rights," especially in regard to slavery, resulted in demands that woman be given the ballot. The temperance movement and the need to protect property and family rights strengthened this demand. In 1848 the first woman's suffrage convention demanded the ballot, basing their claims on the Declaration of Independence. The extension of the franchise to the negroes led to renewed demands in behalf of women. In 1866 the first petition demanding national suffrage for women was sent to Congress, and in 1868 the New England Woman's Suffrage Association was formed. Gradually the suffrage leaders of the entire United States were organized. The new States and Territories of the West were the first to make women the political equals of men, and that region is still the stronghold of woman suffrage, though the States east of the Appalachians are being strongly influenced. At present women enjoy equal suffrage with men in 15 States and one Territory: Wyoming, 1869; Utah, 1870, 1896; Colorado, 1876, 1893; Washington, 1883, 1911; Idaho, 1896; California, 1911; Arizona, Kansas and Oregon, 1912; Alaska Territory, 1913; Montana and Nebraska, 1914; New York, 1917; South Dakota, Michigan and Oklahoma, 1918. In 12 other States women have recently been given the right to vote in municipal elections and for offices created by statute: Illinois, 1913; North Dakota, Nebraska and Rhode Island, 1917; Minnesota, Iowa, Wisconsin, Missouri, Indiana, Maine, Vermont and Tennessee, 1919. The right of women to vote in party primaries was granted by Arkansas in 1917 and by Texas in 1918. In eight States women property-holders may vote on matters relating to taxation, and in 19 States in school elections. In 17 States, 11 of which are in the South, women have no form of political suffrage. It is estimated that now (1919) about 6,000,000 women have equal suffrage with men. During the presidential campaign of 1916 both candidates declared for woman suffrage — Wilson, Democrat, for the ballot by State action; Hughes, Republican, for suffrage through Federal constitutional amendment. Wilson later supported the movement for Federal grant of suffrage, and in 1918 Congress sent out to the States an equal suffrage amendment which within a year was ratified by 14 States. In all States suffrage organizations have been formed and the national association has headquarters in New York.

The effects of woman suffrage are not yet clearly evident. Both men and women vote in larger proportions than did men before the vote was given to women. Enfranchised women generally favor legislation for social reforms — for prohibition, better schools, better conditions for women workers, the restriction of commercialized vice, and the regulation of child labor.

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44. CIVIL AND RELIGIOUS LIBERTY. The euphony and familiarity of this title must be broken so as to read, "Religious and Civil Liberty in America," if we study the subject in its logical chronological order, for civil liberty follows and is the product of religious liberty. A hierarchy implies an aristocracy; an aristocracy a monarchy. The student can do no better than to group his studies around the names of Roger Williams (q.v.) and Thomas Jefferson (q.v.). The birth of the one preceded that of the other by 136 years. The pivotal date of the first is the founding of the Providence Plantation by the exiled Roger Williams, 1636; and the pivotal date of the other is the signing of the Declaration of Independence in 1776. These two events are separated by a period of 140 years. The story of these two men is told elsewhere in these volumes, but the story of civil and religious liberty in America cannot be separated from their lives; still less can its purchase price be understood or appreciated apart from their story. Says John Fiske:

> Within five years from the settlement of Massachusetts this young preacher — the learned, quick-witted, pugnacious Welshman, Roger Williams, had announced the true principles of religious liberty with a clearness of insight quite remarkable in that age.

There is good history back of the pleasantry that the Puritans sought the western shore in order that they might enjoy the privilege of worshiping God according to the dictates of their own conscience and the further privilege of making all others worship in the same way. Governor Winthrop, one of the most liberal of the Boston colony, wrote:

> We believe it to be important that the members of a Christian commonwealth should all hold the same opinions regarding essentials; and of course it is for us to determine what is essential. If people who have come here with us hold different views, they have made a great mistake and had better go back to England. But if, holding different views, they still wish to remain in America, let them leave us in peace and, going elsewhere, found communities according to their conscience of what is best. We do not wish to quarrel with them, but we will tell them plainly that they cannot stay here.

This is literally the program carried out in the case of Roger Williams. From the beginning he denied the power of civil magistrates to punish for violations of "the first tablet of the law," the table of piety, dealing with man's relations to his God. He declined the call to enter upon his chosen work with the settlement on Massachusetts Bay because they were not "separated," as the Pilgrims were who settled at Plymouth; they were simply non-conforming members of the Episcopal Church, and as such they claimed the right to discipline for spiritual as well as civic misdemeanors. A few months later he accepted the opportunity to work with and for the Pilgrim Fathers of Plymouth. Here he worked for two years, supporting himself by manual toil during the week and teaching on Sunday. But his ecclesiastical independence and his persistent teaching of the principles of soul-liberty filled Elder Brewster with anxiety, and when a call was given the young radical from the Salem Church, the good elder advised the Plymouth Church to demit him. In the latter controversy John Cotton, the belligerent ecclesiastic of Boston, remembered that "Elder

Brewster warned the whole church of the danger of his spirit."

When in 1633 the young minister ventured again within the jurisdiction of the Bay and took up the work of a religious teacher at Salem, the Boston ministers protested and objected to his coming among them at the ministers' meetings held from house to house. Two years later he was summoned to Boston to answer charges before the General Court. He was accused of teaching that magistrates ought not to punish a breach of the "first table" except when it was also a disturbance of the civil peace; that the church had no right to impose an oath on an unbeliever, and that prayer at the sacrament or after meat must not be enforced by the magistrates. Williams' defense was that "none of his teachings led to a breach of holy or civil peace, of which I have desired to be unfeignedly tender." Governor Winthrop, of whom Williams wrote years afterward "Though he was carried with the stream for my punishment, he tenderly loved me to his last breath," recorded in his diary:

' Rev. Mr. Hooker, who was chosen to dispute with him could not reduce him from any of his errors, so the next morning the Court sentenced him to depart out of our jurisdiction within six weeks, all the ministers save one approving the sentence.

The sentence itself in part runs as follows:

It is therefore ordered that the said Mister Williams shall depart out of this jurisdiction within six weeks now next ensuing, which, if he neglects to perform, it shall be lawful for the Governor and two of the magistrates to send him to some place out of this jurisdiction, not to return any more without license from the Court.

But soon this six weeks' leniency caused the magistrates anxiety; they were afraid he would be able to carry out his expressed purpose of "establishing an independent community where all men may work as their conscience persuades them, everyone in the name of God." A captain of a sloop was, therefore, sent with orders to apprehend Williams and carry him on board his ship about to sail for England. The captain found the wife and children, but the minister had departed three days before. Thus in midwinter, January 1636, this earliest apostle of religious liberty in America, and, up to this date, one of the very few such apostles in the history of the world, secretly departed from Salem, leaving wife and children behind him. He sailed away, according to the advice of Governor Winthrop who, apparently ashamed of the precipitancy and narrowness of his clerical colleague, had advised Mr. Williams to retire promptly to the Indians on Narragansett Bay, where he would be beyond English claims and patents. His own account of this momentous exodus in America runs in part as follows:

I steered my course from Salem — though in winter snow, which I feel yet — unto these parts wherein I may say *Persid*, that is, I have seen the face of God. I first pitched, and then began to build and plant at Seekonk, now Rehoboth; but when I received a letter from my ancient friend, Mr. Winslow, then governor of Plymouth, professing his own and others' love and respect to me, yet lovingly advising me, since I was fallen into the edge of their bounds, and they were loth to displease the Bay, to remove but to the other side of the water; and then he said I had the country free before me, and might be as free as themselves, and we should be loving neighbors together. These were the joint understandings of these two wise and eminently Christian governors, and others, in their day, together with their counsel and advice as to the freedom and vacancy of this place, which in this respect and many other providences of the Most Holy and Wise One, I called Providence.

Following the voyage came the desperate exposures on land,—"fourteen weeks of bitter winter season without knowing what bread or bed did mean," in his own phrase. His only succor was received at the hands of the Indians, whose language he had mastered during his Plymouth ministry for a purpose higher than he could then have dreamed of. When the final place of settlement was reached on Rhode Island, he said: "In gratitude to God's merciful providence to me in my distress, I gave to the place the name of Providence."

Henceforth the story of Roger Williams is the story of the planting of what is probably the first commonwealth in history into whose fundamental constitution was incorporated an unequivocal guarantee of religious liberty. From Constantine to Williams, the Christian Church, always and everywhere in Christendom, dominated the State. Indeed, in all religions and in all ages, up to this time, priests have more or less directly claimed to be the arbiters of the civic and physical interests as well as of the spiritual destinies of men. The quality and quantity of the work accomplished by Roger Williams cannot be appreciated until the spirit of the Puritans, of whom he was one and with whom he contended, is more closely studied and understood. Popular traditions have lumped the various settlements of New England under one estimate, as one movement. The Puritans have been studied too much in bulk, as though they represented a coherent and consistent body, moving forward with one spirit and for one end: that spirit the spirit of freedom, and the one end religious and civil liberty. But the banishment of Roger Williams is but one of a series, albeit the first of such acts. The noble Henry Vane arrived in Boston three months before Williams had to flee. Though a young man of only 24 years, he was of such brilliant powers that he was made governor of Massachusetts. But the spirit of the people was too intolerant, the air too dogmatic for him to stay, and in less than three years he went back to England to his larger career and to a tragic death for freedom's sake. In 1636 came Anne Hutchinson, the brilliant woman who preached transcendentalism before the Transcendentalists: a woman who was gladly heard in the pulpit at that early date; she gathered around her a growing following,— but she must not stay. With her band of followers she had to go. They turned their faces toward the land of greater freedom, the hospitable Rhode Island, where for a while she tarried on her way to death from an Indian's tomahawk in the neighborhood of what was to be New York.

The persecuted Quakers were naturally drawn to the boasted freedom of the New World, but when Anne Austin and Mary Fisher, representatives of this fellowship, landed at Boston from Barbados in 1656, they were promptly locked in jail lest they might proclaim their heresies to the curious crowd that gathered around them. A council pronounced their doctrines blasphemous; their books were burned and they themselves confined under hard circumstances for five months, until the ship they had come in was ready to return them to Barbados. Later these Quaker missionaries found a more cordial welcome at the hands of the Mohammedans in Turkey than they did at the

hands of the Christian Puritans in Massachusetts. However, the contention of John Fiske, that the Puritans had more at stake than the Mohammedans, deserves to be considered in this connection. Following these two women came eight Quakers from London, who were promptly arrested and special laws were passed that they might be disposed of. The penalties afixed in these anti-Quaker laws were cumulative, passing on up from flogging, through imprisonment at hard labor, cutting off one or both ears, boring the tongue with a hot iron, until finally capital punishment was reached in 1659, when two were hanged on Boston Commons. This was going farther than Quaker persecution had ever reached in old England; and next year a Quaker woman was hanged at the same place. The last victim suffered in 1661 for the sole crime of holding to and practising the precepts of George Fox, as represented by the fellowship of the Friends.

There is no finer test of a man's sincerity than that which demands that he take his own medicine. Roger Williams was called upon to apply his own doctrines in the case of the Quakers. From their teachings he dissented most heartily; he never came so near the intolerant spirit as in the book entitled 'George Fox Digg'd out of his Burrowes,' and George Fox never came so near dealing in venom as in his reply, entitled 'A New England Fire-Brand Quenched.' And still the communities of Rhode Island not only refused to join with the New England confederacy in a movement to keep out the Quakers, but welcomed them in spite of their views. When George Fox visited this country he did not dare go farther north than Newport, R. I., where he was sheltered in spite of his teaching. Hither Williams went, 30 miles in an open boat, he himself working the oars, not to suppress, but to hold high debate with the great disciple of soul-liberty, who had stood the test in England even as Roger Williams had in America, and who, in his doctrine of the "inner light" and the non-combatant requirement of religion had found a more ample foundation for religious liberty than the probably less heterodox opinions of Williams.

As with the followers of Anne Hutchinson and George Fox, so with the Jews. Williams pleaded their cause with the powers of England, and the hunted children of Israel found shelter and welcome at Newport, where the lonely graves of the exiled community moved Longfellow two centuries later to sing the pathetic song of toleration entitled "The Jewish Cemetery at Newport."

Twice, at least, Roger Williams returned to England in the interest of the new community, each time for the sake of strengthening the safeguards of religious liberty in his charter rights. The first time he was obliged to sail from Manhattan, for he was an exile from Boston. Once his stay was prolonged for three years, during which time he was deep in the politics of the Protectorate, an active helper of Cromwell, and an intimate associate of Cromwell's Foreign Secretary, "Mister Milton," to whom he taught Dutch. Scant justice has as yet been done to the benignant and ameliorating element introduced into the history of the United States, particularly of the New England States, by Roger Williams. He came to reform the reformers, of whom Hawthorne facetiously said:

> Let us thank God for having given us such ancestors and let each successive generation thank Him not less fervently for being one step further from them in the march of ages.

Williams necessarily had much fighting to do. The titles of his books suggest controversy. 'The Bloudy Tenantt of Persecution for Cause of Conscience; A Dialogue Between Truth and Peace,' is his most noted work. This a Puritan House of Commons caused to be burned in England. To this John Cotton wrote the reply entitled 'Bloudy Tenantt Washed and Made White in the Bloud of the Lamb.' In due time came the rejoinder from Williams, 'The Bloudy Tenantt Yet More Bloudy by Mr. Cotton's Attempt to Wash it White in Bloud of the Lamb.' But notwithstanding this belligerency, Williams vindicated the liberty he espoused and demonstrated in his own life that liberty and the love of liberty breed tenderness and not violence. "We have taxed your patience often, but never exhausted it," wrote Governor Winthrop. And his latest biographer, Oscar S. Straus, says: "In no act of his life is a spirit of selfishness disclosed"; and again, "His patriotism was never dimmed by a shadow of suspicion of self-interest"; and again, "He held his colony with a firm hand and a wise head." He never preferred to be the power behind the throne rather than to be the power on the throne. When the Indians were at last nagged into the violence that led to the invasion of Rhode Island, Roger Williams, unarmed save with his staff, went out to meet them. He failed to turn them back, but they said, "We will not hurt you, Brother Williams." This accomplished linguist, the master of seven languages, spent his 70 years and more in unceasing toil, much of the time earning his bread by manual labor. He alludes to a sacrifice of his own interests by refusing to kiss the Bible when taking an oath in England, but furnishes no particulars. Everywhere and always he kindled the spirit of liberty, and was never known to light the fires of persecution.

The first compact of the little band of exiles on the hill he named "Providence" carried the signatures of 13 men, five of whom made their mark. It was of such humble material that he laid the foundations of the first state ever unequivocally committed to religious liberty. His first-born son is supposed to have been the first white child in Rhode Island. The last charter he obtained from Charles II was so wisely drawn, and liberty in it was so securely vouchsafed, that it served the commonwealth of Rhode Island for 180 years; it was not changed until 1843, and it would still serve as a model for a new State.

Thus the movement for religious liberty in America unfolded naturally into a passion for democracy, a demand for civil liberty, and our study lands us at the feet of Thomas Jefferson, who was the father of civil liberty in America, so far as movements whose beginnings are always hid in the obscurity of still more primitive beginnings can be said to have a father.

"*Author of the Declaration of Independence, of the statute of Virginia for religious freedom, and Father of the University of Virginia,*"

was the inscription which Thomas Jefferson left among his papers as one suitable for his own tomb. In another catalogue of things accomplished, drawn up by his own hand, we find the following: "Separated the church and state in Virginia; put an end to entails; prohibited the importation of slaves, and drafted the Declaration of Independence."

Mr. Jefferson was the wisest read, the most accomplished of the Presidents, the intellectual giant of them all; the first, if not the greatest, thorough-going Democrat in American politics. Jefferson, Jackson and Lincoln are the three Presidents who, in practice as well as in theory, by nature as well as by conviction, believed so profoundly in popular government and the simplicity and freedom involved therein that it became to them a religion, a source of unfailing enthusiasm. These three belonged to the people and found their highest inspiration in the purpose to serve them. The opinions of no other President ever received such prompt respect at home and abroad as those of Thomas Jefferson, and his official utterances occupy a place in literature as well as in the history of statesmanship unparalleled by the deliverances of any other President of the United States, save Lincoln.

Jefferson's devotion to civil liberty led to, or sprang from, his freedom in religious thought, in which he was notoriously unorthodox. He was deeply versed in the writings of French philosophers and the events that led up to the Revolution, and was sufficiently grounded in the philosophy of liberty to be able to give at short range the true estimate of that atmosphere-clearing storm which all clear thinkers at longer range are able to give it. He was a confidant and friend of Thomas Paine, and the principles laid down in 'The Rights of Man' and 'Common Sense' were not only familiar but congenial to him and probably had a direct influence upon his work. These documents, together with the life of the much-maligned and cruelly misunderstood author, should be closely studied in connection with the subject at hand.

At the first Congress, systematically convened at Philadelphia in 1774, Thomas Jefferson was chairman of the committee appointed to draft the Declaration of Independence, which in due time was offered in his own handwriting, essentially as it now stands; a clause censuring slave trade was suppressed. He regretted the first draft of the Constitution as adopted because he feared the liberties of the citizens were not sufficiently safeguarded; it contained no precaution against monopolies and standing armies; the freedom of conscience and of religion were not sufficiently guaranteed; the rights of habeas corpus were not adequately secured, and no limitation was set to the time one person could occupy the Presidency, which, unguarded, as he feared, might grow into an absolutism more or less complete; in short, because it had no "Bill of Rights." Says one of his later biographers:

> In his day, Mr. Jefferson combated a greater number of laws which were oppressive, customs which were stale, tendencies which were undemocratic, and fixed opinions which were popular than any other man in public life. He attacked systems and creeds where they were most sensitive. He aroused vested interests which were the most powerful, and which, when alarmed, were the most vindictive. Yet never once in all his long life did he falter, surrender, or apostatize.
>
> He took the unpopular side of slavery, and held to it. He defied the religious bigotry of his times, and continued to defy it. He challenged the organized power of land monopoly and class rule in his own State and overthrew it.

The first session of Congress after the adoption of the Constitution in 1789 adopted 12 amendments, most of them looking toward the relieving of the above anxieties expressed by Mr. Jefferson; the first amendment providing for the religious freedom of all the citizens and the unequivocal separation of Church and State. The constitution of nearly every State in the Union now has its "Bill of Rights." Most of these bills incorporate the exact phraseology of the Declaration of Independence concerning the "inalienable rights to life and liberty, and the pursuit of happiness." This guarantee of religious liberty is somewhat modified by the following States:

Maryland declares a person incompetent as a witness or juror who does not believe

> in the existence of God, and that under His dispensation such person will be held morally accountable for his acts, and be rewarded or punished therefor in this world or the world to come.

The law of Maryland provides that "a belief in the existence of God" is a necessary qualification "for any office of profit or trust in this State." And also:

> That every gift, sale or devise of land to any minister, public teacher, or preacher of the gospel, as such, or to any religious sect, order or denomination, or to or for the support, use, or benefit of, or in trust for, any minister, public teacher, or preacher of the gospel, as such, or any religious sect, order, or denomination; and every gift or sale of goods, or chattels, to go in succession, or to take place after the death of the seller or donor, to or for such support, use or benefit; and also every devise of goods or chattels to or for the support, use or benefit of any minister, public teacher or preacher of the gospel, as such, or any religious sect, order or denomination, without the prior or subsequent sanction of the Legislature, shall be void; except always, any sale, gift, lease or devise of any quantity of land, not exceeding five acres, for a church, meeting house, or other house of worship, a parsonage, or burying ground, which shall be improved, enjoyed, or used only for such purpose; or such sale, gift, lease, or devise shall be void.

Mississippi provides that "The Holy Bible shall not be excluded from use in any public school of this State"; and makes a six months' residence a sufficient qualification for voting to a minister of the gospel, while two years' residence is required for a layman.

New Hampshire provides that:

> The people of this State have a right to empower, and do hereby fully empower the Legislature to authorize, from time to time, the religious societies within this State to make adequate provision at their own expense, for the support and maintenance of public Protestant preachers of piety, religion, and morality; provided, notwithstanding, that the several towns, parishes, bodies corporate, or several religious societies shall at all times have the exclusive right of electing their own public teachers, and of contracting with them for their support and maintenance.

Vermont, after providing freedom of conscience for all and the free exercise of religious worship in sweeping phrase, adds in Article III:

> Nevertheless, every sect or denomination of Christians ought to observe the Sabbath or Lord's Day, to keep up some sort of religious worship which to them shall seem most agreeable to the revered will of God.

Virginia, though perhaps the first State after Rhode Island to provide for absolute separation of Church and State, introduces a curious

inconsistency, evidently quite unconsciously, in this wise:

It is the mutual duty of all to practice *Christian* forbearance, love, and charity toward each other.* ..

"Tell the committee to be on the alert," were the last audible words that Jefferson spoke. His lips seemed to dictate to the fingers that still imagined a pen between them. This suggests the "eternal vigilance" that is the "price of liberty."

Ever since the signing of the Declaration of Independence there have been those in the United States who would dispose of its fundamental contention as a "glittering generality," or limit its application to their own sect or race; but, spite of sneers, past or present, evasions and contemptuous appeals to technicalities, it still survives as the matchless document that not only liberated the United States from foreign thrall, but by its logic is destined to enfranchise the children of the world. Side by side, Jefferson's Declaration of Independence and Lincoln's Emancipation Proclamation stand in the world's library, unmatched and undimmed, to rebuke, to instruct and to inspire unborn generations. They were and still are prophetic documents. The Civil War which Jefferson foresaw came, and he who would study the story of civil and religious liberty in America must take note of such events as the martyrdom of Elijah Lovejoy (q.v.), and the destruction of his abolitionist press at Alton, Ill. (1837); the appearance of Harriet Beecher Stowe's 'Uncle Tom's Cabin' (1852); the execution of John Brown (q.v.) at Harper's Ferry (1859); the firing upon the flag at Fort Sumter (1861); the Emancipation Proclamation of Abraham Lincoln (1863); the surrender of Robert E. Lee at Appomattox (1865).

In studying civil and religious liberty we find that, though they may be distinguishable in their sources, they are one in their culmination. Not more clearly did the passion for religious liberty make of Roger Williams an advocate of political liberty than did Thomas Jefferson's zeal for political liberty make of him an apostle of religious liberty. The government has recently ordered published a little manuscript book of Thomas Jefferson's, entitled 'The Life and Morals of Jesus of Nazareth, Extracted Textually from the Gospels, together with a Comparison of His Doctrines with Those of Others.' In this book the author compiled the ethical and spiritual portions of the Gospel, eliminating the miraculous and theological passages. Of the compilation he himself wrote:

A more beautiful or precious morsel of ethics I have never seen. It is a document in proof that I am a REAL CHRISTIAN; that is to say, a disciple of the doctrines of Jesus, very different from the Platonists who call ME infidel and THEMSELVES Christians and preachers of the Gospell while they draw all their characteristic dogmas from what its author never said nor saw.

The conviction indicated in this book may be right or wrong. I refer to it because it illustrates the liberty vouchafed by the fundamental laws of the United States, which not only guarantee freedom of utterance, but lead to a respect for sincere opinions, however they may differ from prevailing opinions.

Any sketch of the history of civil and religious liberty in America would be incomplete without reference to the interesting contributions of Lord Baltimore in Marvland, of William Penn in Pennsylvania and the Utopian schemes of John Locke and Lord Shaftesbury in the Carolinas. It is one of the interesting paradoxes of history that the Catholic Calverts, who held the most sweeping charter ever brought to the New World, should establish a standard of hospitality in religion and liberality in politics exceeding that of any other colony.

Lord Baltimore came to establish a "Palatinate," a palace county. He was made absolute lord of a vast territory with powers to declare war, collect taxes, create legislatures and appoint judges. But knowing from experience the heavy hand of religious bigotry, his autocracy was a benign one. It offered hospitality to the persecuted in all lands and established many precedents precious to liberty.

The Quaker spirit represented by William Penn and his associates and successors was and is a pervasive influence, making for toleration, peace and co-operation. While the dreams which the free-thinking philosophers above mentioned tried to realize in South Carolina may be taken as forerunners of many sociological ventures on communistic or ideal lines that have followed, perhaps the most suggestive and creative of which was the work of Robert Owen at New Harmony, Ind. At any rate, from New Harmony to Altruria, the story is an attractive one to the social philosopher and a potent one in the interest of civil and religious liberty.

The law of the land demands toleration, but spiritual freedom goes further and demands appreciation and fellowship in the things about which men honestly differ. He who would study closely the development of religious liberty in America must note the discussions and agitations that gathered about the following epoch-marking addresses: Channing's Baltimore address (1818); Emerson's Divinity School address, which, to use his own words, "caused such a tempest in the Unitarian washbowl," and in consequence of which Harvard for 30 years practically exiled its most illustrious alumnus from the platform of the freest university in America (1838); Theodore Parker's discourse on 'The Transient and the Permanent in Christianity' (1841); William C. Gannett's address on 'The Faith of Ethics' (1887).

The growth of the spirit of religious liberty may be further traced by a close study of the most noted religious controversies in our history, among which were the discussion concerning the teachings of Horace Bushnell (1839–54) by the Congregationalists of New England; the withdrawal of Henry Ward Beecher (1882) from the local Congregational Association to which he belonged; the trial of David Swing (1874) by the Presbyterians of Chicago and of Hiram W. Thomas (1881) by the Methodists of Chicago. Significant also in the history of religious liberty is the organization of the Free Religious Association in Boston (1867) and the holding of the Parliament of Religions in Chi-

* The above study of the State constitutions is based on the study of the text found in the Convention Manual for the Sixth New York State Constitutional Convention, published in 1894. Doubtless further amendments have been enacted since then, and our attention has been called by Judge E. O. Brown of the Circuit Court of Illinois, to certain omissions in the New Hampshire Constitution as published in this work, bearing on the question in hand.

cago (1893). This was the most significant religious conclave ever held, perhaps the noblest corporate event in the history of religion. This was followed the next year (1894) by the organization of the Congress of Religion in Chicago and the subsequent organization of the New York Conference of Religion, a similar organization within State limits. Significant indications of the growth of this spirit of co-operation, which springs out of the spirit of religious liberty, are found in the numerous interdenominational organizations for practical work, such as the Young Men's and Young Women's Christian Associations, the Christian Endeavor movement, the Woman's Christian Temperance Union, the Chautauqua movement and the various combinations for missionary work at home and abroad.

The development of civil and religious liberty is still incomplete; it still behooves "the committee to be on the alert." But the great advancement made in this direction is a magnificent guarantee of greater progress yet to be made. The high achievements already realized will inspire a continued zeal to evoke the new wisdom and fresh courage which the future of America will demand. See LIBERTY, RELIGIOUS.

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45. DISPUTED ELECTIONS. On four occasions the electoral colleges have failed in the task of choosing a President and Vice-President. In 1801, after the counting of the electoral vote, the question was left to settle which of the two men, Jefferson or Burr, should be President, and which Vice-President. In 1825 it remained to choose a President from among the three candidates, Andrew Jackson, John Quincy Adams and William H. Crawford. In 1837 it was left to determine whether Richard M. Johnson or Francis Granger should be Vice-President. In all these cases the difficulty was merely that the electors had so distributed their votes that the choice was incomplete. And the Constitution of the United States pointed out the procedure by which to complete it. The fourth case arose in 1877. The task was now thrust upon the government of deciding between rival electoral colleges in four States. This would determine whether Samuel J. Tilden and Thomas A. Hendricks, the candidates of the Democrat party, or Rutherford B. Hayes and William A. Wheeler, who were the Republican candidates, should become President and Vice-President respectively. There was no agency provided by the Constitution or laws to decide such a question.

The dispute of 1801 was a natural result of the rule laid down in the Constitution for the procedure of the electors. Each elector should vote for two persons. The person found to have the greatest number of votes should be the President, provided such number was a majority of the whole number of electors. The person having the next greatest number should be the Vice-President. But since a majority of the electors might be only one more than a quarter of the votes, and each elector cast two, it was possible for two persons to receive an equal majority vote. The constitutional provision for this contingency was that the House of Representatives should immediately choose by ballot one of the two persons for President. This vote must be taken by States, and the representation from each State should have one vote. A majority of the States was necessary to a choice. The official count of the electoral votes was made before the two Houses of Congress as prescribed by the Constitution. This was done on Wednesday 12 February, Jefferson himself presiding. There were 138 electors and 276 votes. The vote was distributed as follows: Thomas Jefferson, 73; Aaron Burr, 73; John Adams, 65; Charles Cotesworth Pinckney, 64; John Jay, 1. It had been anticipated that the electoral vote would not be decisive. Two days before the count the House of Representatives had adopted rules of order for the expected election. The representatives should be grouped by States, in order to determine for whom the vote of each State was to be cast. If the preliminary vote of any State resulted in a tie, that delegation could only cast a ballot marked "divided." Each State should appoint one teller. Two ballot boxes should be used and each delegation should cast its ballot in duplicate. The tellers should be divided into two groups, one to examine the votes in each ballot box. The Senate was to be admitted. The House should not adjourn until the election was complete. Immediately after the count the House of Representatives began to vote for a choice between Jefferson and Burr. By midnight 19 ballots had been taken. The sitting continued until 11 o'clock the next day, nine ballots being taken on 12 February. The rule against adjournment was now evaded by taking a recess. One ballot was taken 13 February, four on the 14th, one on the 16th and two on the 17th. From the beginning eight States cast their ballots for Jefferson. These were New York, New Jersey, Pennsylvania, Virginia, North Carolina, Georgia, Kentucky and Tennessee. Six voted for Burr. These were New Hampshire, Massachusetts, Rhode Island, Connecticut, Delaware and South Carolina. The remaining two, Vermont and Maryland, were divided. Nine States were necessary to a choice. The House was Federalist, while both of the candidates belonged to the other party. The chief issue was the commercial policy of the next administration. As Jefferson came from Virginia and Burr from New York, New England stood by the latter. Burr did not receive the vote of his own State. This was due to Hamilton's influence. Prior to the 36th ballot, which was taken 17 February, some assurance was given on the question of the commercial policy. Vermont and Maryland now voted for Jefferson. At the same time South Carolina and Delaware cast blank ballots. Jefferson was thus chosen President by the vote of 10 States. Burr became Vice-President. Before the next Presidential election, the Constitution was amended to prevent the recurrence of such a dispute. The new amendment declares that the electors shall name in their ballots the person voted for as President and in distinct ballots the person voted for as Vice-President.

By the official count of 9 Feb. 1825, the electoral vote for President was found to stand as follows: Andrew Jackson, 99; John Quincy Adams, 84; William H. Crawford, 41; and

Henry Clay, 37. The number of electoral votes necessary to a choice was 131. The ballot for Vice-President had been decisive; for John C. Calhoun had received 182 votes. The Constitution limited the House of Representatives in its choice of a President to the three highest candidates. The first ballot gave Adams the vote of 13 States; Jackson that of seven States; and Crawford that of four States. There was great popular indignation, for Jackson had received 15 more electoral votes than Adams. And besides this the Jackson electors had received a great majority of the popular vote. A rumor became current that there had been a "corrupt bargain" among the Adams and the Clay men. This seemed to be confirmed as soon as President Adams took his seat by the nomination of Mr. Clay for Secretary of State. However, it was sufficiently shown later that this story rested upon no evidence.

It was discovered by the official count of 8 Feb. 1837, that the electoral vote for Vice-President had been indecisive. The constitutional rule in such a case is that the Senate shall choose the Vice-President from the two highest numbers on the list. These were Richard M. Johnson and Francis Granger. Upon the motion of one of the members, the Senate proceeded to a viva voce vote. The result was 33 to 16 in favor of Mr. Johnson.

After the elections of 7 Nov. 1876, the first indications were that the Democratic party had chosen a majority of the electors. But the Republican party managers immediately began to claim three Southern States whose votes were likely to decide the issue. These were Florida, Louisiana and South Carolina. When the day arrived for the meeting of the electoral colleges, two sets of electors voted in each of these States and in Oregon as well. Thus four States transmitted double returns to the President of the Senate. Evidently a quarrel was before the country which might set up rival executives in the national government, or leave the nation without an executive. Whether it is agreeable to the Constitution for Congress to regulate by law the counting of the electoral vote, we will not here discuss. The only power relating to this subject, that is expressly granted, is to determine the time of choosing the electors and the time when the electors shall meet. Laws had been enacted concerning the accepting and rejecting of electoral votes prior to 1877. The most discreet men in the government felt that Congress should devise some expedient for dealing with an unprecedented situation. The Electoral Commission Law was enacted. This passed the Senate 25 January, the House of Representatives 23 January and was approved 29 January. Its title was "An act to provide for and regulate the counting of votes for President and Vice-President, and the decision of questions arising thereon, for the term commencing 4 March 1877." It provided in detail for the official count as prescribed by the Constitution. It ordered that this should begin on the first Thursday in February, which was the first day of the month, and that the returns should be acted upon in the alphabetical order of the States. After the reading of each certificate, the president of the Senate should call for objections. In cases which did not involve conflicting returns, the two Houses should pass upon the objections. They should separate for this purpose. No electoral vote should be rejected except by the affirmative vote of both Houses. Section II, the most remarkable part of the law, provided for the Electoral Commission, which was created to pass upon cases where there were double returns from a State. The Senate should choose five of its members by viva voce vote, on the Tuesday before the count began, to serve on the commission. The House of Representatives should likewise choose five members. Five associate justices of the Supreme Court were also to serve. The law designated four of these under the numbers of their respective circuits, the first, third, eighth and ninth. These were to select the fifth. When any case of double returns was reached in the official count, the certificates and papers relating thereto, together with all the objections filed in the joint meeting of the two Houses, were to be referred to the commission. This body should decide by a majority vote the questions; whether any and what votes returned from a State are the votes provided for by the Constitution of the United States, and how many and what persons were duly appointed electors in such State. The decisions were to be final unless they were set aside by the vote of both Houses of Congress. The members of the Commission were chosen on Tuesday, 30 January. The Senate was Republican at the time, while the House of Representatives was Democratic. Three of the senators selected were Republicans and two were Democrats. The former were George F. Edmunds, Vermont; Oliver P. Morton, Indiana; and Frederick T. Frelinghuysen, New Jersey. The latter were Thomas F. Bayard, Delaware, and Allen G. Thurman, Ohio. In the House this proportion was reversed. The three Democratic members were Henry B. Payne, Ohio; Eppa Hunton, Virginia, and Josiah Abbott, Massachusetts. The two Republicans were James A. Garfield, Ohio, and George F. Hoar, Massachusetts. Of the four justices designated by the law, Nathan Clifford and Stephen J. Field of the first and ninth circuits respectively were Democrats. William Strong and Samuel F. Miller, of the third and eighth circuits, were Republicans. Thus far the commission was equally divided. Moreover the arguments were likely to be so strong on both sides of the different questions that the decisions would inevitably follow party lines. While the law seemed to shift the burden of decision upon 15 men, it so operated that it was really imposed upon one man. It had been expected that the four associate justices would select Justice David Davis to be the 15th member of the commission. Mr. Davis was independent in politics. But he had accepted an election to the United States Senate, which was thought to make it unsuitable for him to serve. Justice Joseph P. Bradley of the fifth circuit was chosen. This made the commission consist of eight Republicans and seven Democrats. At the final sitting Senator Thurman was unable to serve on account of illness and Francis Kernan, New York, a Democrat, was substituted. The two most important United States laws pertaining to Presidential elections were enacted 1 March 1792 and 23 Jan. 1845, respectively. The act of 1792 provides that the executive authority of each State shall cause lists of the

names of the electors of such State to be certified and delivered to the electors, and that the electors shall annex one of the said lists to each list of votes. The law of 1845 declares that each State may by law provide for the filling of any vacancy or vacancies which may occur in its college of electors, when such college meets to give its electoral vote. Numerous cases came up in the count of 1877, to which these provisions were applicable. The Electoral Commission held four sittings. The first one began 2 February, when the returns from Florida were reached. It took a week to come to a decision in this case. The returns of the Hayes electors were certified by the governor in office on the day when the electors met. But it was believed that the State returning board, which had declared for a Republican victory, had in canvassing the votes of the State rejected the returns from certain polling-places. On the other hand, the returns of the Tilden electors were certified by the attorney-general. And there was a duplicate of the same returns certified by a new Democratic governor. An additional cause of dispute in the case of Florida grew out of the charge that one of the Hayes electors held an office under the United States government at the time when he was elected, and was, therefore, ineligible. This objection was based upon the constitutional provision that no person holding an office of trust or profit under the United States shall be appointed an elector. The decision of the commission was based upon the ground that the returns of the Hayes electors were certified according to the law of the United States, and that the returning board had operated under the laws of Florida. To set these returns aside would be to go behind the action of the State officers. This the commission was incompetent to do. And it would be impossible to investigate the charges of fraud. As for the one elector who was objected to on the charge that he held an office under the United States, it was concluded after hearing evidence on both sides that he had properly resigned the office. The commission, therefore, held by a vote of eight to seven that the four Hayes electors were the lawful ones. This decision was reported 9 February. The Electoral Commission was next in session 12–16 February, as the official count had now reached Louisiana. This State presented the spectacle of rival governments. The Republican officers claimed authority under the canvass of the State returning board. The Democratic ones claimed that under the popular vote as cast they had been elected. The returns of the Tilden and the Hayes electors were certified by rival executives. The commission maintained that the Republican government held office by the operation of the laws of the State. In this case, as in that of Florida, there were charges of fraud and ineligibility. But the commission could not go back of the certificate of the State authority. Accordingly the eight Hayes electors were held to be the rightful ones. The commission was again in session 21–23 February, to pass upon the returns from Oregon. The Republican party had carried the election but the governor, who was a Democrat, had certified to the election of only two of the Hayes electors. The third certificate was issued to the highest Tilden elector on the ground that the third Hayes elector was a postmaster. As the two Republican electors refused to meet with the Democratic one, both sides proceeded to fill the vacancies in the electoral college. The Republican electors appointed the man from whom the governor had withheld the certificate. The one Tilden elector appointed two other Democrats. The governor certified to the returns of the Tilden electors. Those of the other college were certified to by the secretary of state. The reasoning by which the disputes about Florida and Louisiana were decided operated in this case in favor of the Tilden electors. But the commission made a distinction. In those cases it had inquired whether the executive authority had carried out the laws of the State and had found that it had done so. Thus it was incompetent for the commission to inquire further. But in the case of Oregon it found that the governor had not carried out the laws. Accordingly the commission was competent to make him do so. Thus the three Hayes electors were recognized. On 26 February the returns from South Carolina were submitted to the commission. The votes of the Hayes electors were duly certified by the governor. But fraud on the part of the returning board and intimidation at the polls were charged. On the second day the commission decided that the returns of the seven Hayes electors should be accepted. The decision in favor of the Hayes electors was made in every case by a party vote of eight to seven. Moreover the Senate voted on each occasion to accept the decision and the House of Representatives to reject it. As the count proceeded, six cases of disputed votes came up which were not referred to the Electoral Commission, as they did not involve conflicting returns. In the electoral colleges of Michigan, Nevada, Pennsylvania, Rhode Island, Vermont and Wisconsin, respectively, vacancies had been caused by ineligibility, and the other electors had proceeded to fill the places. Some of the votes were objected to on this account. The two Houses concurred in accepting some of these and differed with respect to others. There was no concurrent vote to reject. It was in the early morning of 2 March, only two days before the date set by the Constitution for the existing administration to come to an end, that the result of the official count was announced. The vote as accepted stood Tilden and Hendricks 184, Hayes and Wheeler 185. Thus if the decision of the Electoral Commission had been different in the case of a single elector, the contest would have been decided in favor of the other party.

After this contest was settled there were numerous movements in Congress to amend the Constitution so as to provide for disputed elections. But none of them came to anything. Several laws on the subject were also introduced. It was 10 years afterward that a law disposing of such cases was enacted, the date being 3 Feb. 1887. This act is a lengthy one and provides in detail for the certification of electors and the counting of electoral votes. Its great provision is that the States shall provide under their own laws by judicial or other methods of procedure to settle disputes as to the choice of electors. The decision arrived at within the State must be accepted. The only case that could arise for the national govern-

ment to settle would be that of rival tribunals within a State sustaining rival electors. The rule in such a case is that no vote can be rejected except by the affirmative vote of both Houses of Congress acting separately. See BALLOT; ELECTIONS.

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46. IMPEACHMENT. Impeachment in the national government is the formal act by which the House of Representatives makes accusations, before the Senate, against the President, the Vice-President or any "civil officers" (executive and judicial officers, except those of the army and navy) of the United States government. It is analogous to an indictment by a grand jury, though it is not confined to indictable offenses. Impeachment developed in English history before the establishment of the modern cabinet system, as a power by which the representatives of the people could control the agents of the irresponsible king, who, according to theory, could do no wrong. After the establishment of the Parliaments supremacy, and the present method of conducting the government, the custom gradually fell into disuse. One of the most noted cases was that of Warren Hastings whose trial for misgovernment in India lasted from February 1788 to April 1795, when he was acquitted. The latest case was that of Lord Melbourne in 1806.

The American colonial assemblies adopted the custom in a modified form as a means by which to check the executive and the judiciary. Though the right to remove officials was given to the general assembly by the Fundamental Orders of Connecticut in 1638, by the charter of Connecticut in 1662, and by the charter of Rhode Island in 1663, the word impeachment first appears in 1683 in the Pennsylvania frame of government, which provided that the general assembly should bring the impeachment, and that the council should try the case and pronounce judgment.

The new State constitutions after 1775 contain provisions on the subject: Virginia (1776); New Jersey (1776); Delaware (1776); Pennsylvania (1776); North Carolina (1776); Georgia (1777); New York (1777); Vermont (1777); Massachusetts (1778); South Carolina (1778); Massachusetts (1780); New Hampshire (1784) and Vermont (1786). The New Jersey constitution of 1776 provided that the lower house should bring the impeachment and that the upper house should try it. The New York constitution of 1777 provided that the assembly should bring the impeachment and that it should be tried before a court consisting of the president, the senators, the chancellor and the judges of the Supreme Court. Judgment was to extend no farther than removal from office and disqualification from holding office under the State. The methods of trying the impeachment varied, but the tendency was to have judgment pronounced by the council or senate. The Constitutional Convention of 1787 incorporated the same principle into the Constitution for application in cases of treason, bribery "or other high crimes and misdemeanors," all of which can be punished in the ordinary courts. The House first passes a resolution to impeach and then appoints a committee to present the charges at the bar of the Senate which sits as a high court to try the case. The House also appoints a committee of managers to act for it in the trial before the Senate. At the close of the trial, after the evidence has been introduced and the arguments of the managers and of the defendant's counsel have been heard, each senator is required to vote "guilty" or "not guilty" on each of the articles of impeachment. A two-thirds majority of those present is necessary to convict. The object is not to punish wrong. The penalty can be only removal from office and disqualification from further public service, but the person convicted is still liable to punishment by the ordinary courts, and he cannot receive a reprieve or pardon from the President.

In our national history this constitutional process has been invoked in nine cases; six times against Federal judges, once against a senator, once against a Cabinet officer and once against a President. Only in three cases has it resulted in removal from office: Judge John Pickering in 1803 for drunkenness, profanity and violence on the bench, Judge W. H. Humphreys in 1862 for adhering to the Confederacy and Judge Robert W. Archbold in 1913 for corruption in office. Both Pickering and Humphreys were district judges of the United States: Pickering for the District of New Hampshire, and Humphreys for Tennessee. In the articles against Pickering it was charged that he made decisions contrary to law in a suit involving the seizure of a ship and that he appeared upon the bench "in a state of intoxication, produced by the free and intemperate use of inebriating liquors, and did then and there frequently in a most profane and indecent manner invoke the name of the Supreme Being." Judge Pickering did not attend the trial, but his son entered a plea of insanity and consequent irresponsibility, stating that his father for over two years had been altogether incapable of transacting any kind of business which required the exercise of the judgment or the faculties of the reason; and therefore incapable of corruption of judgment, and therefore that he was "not amenable to any tribunal for his actions." The House managers held that the insanity was the result of habitual drunkenness. On 12 March 1803 he was convicted and removed by a party vote, the Federalists voting in the negative, but the further disqualification to hold office was not inflicted.

Judge Humphreys at the beginning of the Civil War had engaged actively in the secession movement, but had not resigned his position as judge of the Federal District Court for Tennessee. In May 1862, the House preferred against him seven articles of impeachment, based on a secession speech made by him at Nashville, 29 Dec. 1860, on his acceptance of office under the Confederacy, and on his action in the arrest and imprisonment of W. G. Brownlow, a citizen of the United States, in violation of his rights. Judge Humphreys made no defense and on 26

June 1862 he was convicted by unanimous vote of the Senate. The proceeding was merely a formal means of declaring his office vacant.

Justice Samuel Chase of the Supreme Court appointed by President Washington in 1796, an able but partisan judge who frequently indulged in political harangues in his jury charges, and who had incensed the Jeffersonian Republicans of the House by his conduct in certain trials under the Sedition Law, was impeached before the Senate in December 1804 on eight charges relating to arbitrary and unjust conduct, and to highly indecent and extra-judicial reflections upon the government of the United States before the Maryland grand jury. He was found not guilty, probably because it was believed that "his conduct had been rather a violation of the principles of politeness than of the principles of law; rather the want of decorum than the commission of high crime and misdemeanor."

Judge J. A. Peck of the Federal District Court for Missouri was impeached in 1830 on the charge of unduly punishing, for contempt of court, an attorney who had published a criticism of a decision of the judge in a land case (1827). He was acquitted by a vote of 24 against 21.

The case of William Blount, senator from Tennessee, seems to have settled that senators and representatives are not impeachable, on the ground that they are not civil officers. On 7 July 1797, the House, having evidence that Senator Blount was conspiring to transfer New Orleans and adjacent territory from Spain to Great Britain, by means of a hostile military expedition from the territory of the United States, decided to impeach him. Two days later, he was expelled from the Senate, and soon thereafter he was elected to the Tennessee senate. In December 1798, the House managers presented the case before the Senate of the United States for trial. Blount did not appear, but his counsel (Jared Ingersoll and A. J. Dallas) entered a plea that the Senate had no jurisdiction, since a senator is not a "civil officer" of the United States. The Senate sustained his plea and Blount was discharged for want of jurisdiction. The defense also made the plea that Blount, having been expelled, was no longer a senator, and could not be punished after he was out of office for acts done while he was in office.

It is still an open question whether an officer can escape impeachment and trial before the Senate by resignation or dismissal from office. This subject was discussed in the case of William W. Belknap, who was impeached in 1876 for using his position as Secretary of War as a means of securing bribes from an Indian agent whom he had appointed at Fort Sill. A few hours before his impeachment he resigned his office and his resignation was accepted by the President. Belknap's counsel made the plea that the House had no power to impeach anyone who by resignation or otherwise had ceased to be "a civil officer of the United States." By a vote of 37 to 29 the Senate decided that Belknap was amenable to trial by impeachment. On most of the articles 36 senators voted "guilty" and 25 voted "not guilty," and thus Belknap was acquitted. More than one-third of the Senate refused to vote for conviction, on the ground of lack of jurisdiction over an officer who had resigned. This precedent may not be regarded in future cases, however.

The most prominent case of impeachment in our history was that of President Andrew Johnson. It was the result of the violent controversies concerning policies of reconstruction, and was inspired largely by party motives. The President vetoed some of the most important measures of Congress and belligerently condemned its policy of reconstruction. Congress passed all important measures over his veto, and sought to reduce his power and influence in other ways, especially by the Tenure of Office Act of March 1867. Johnson denounced Congress in very intemperate language, and by demanding the resignation of Edwin M. Stanton, Secretary of War, attempted to ignore the Tenure of Office Act which had stripped from him the power to remove executive officials. The House was thoroughly aroused, and on 3 March 1868 brought articles of impeachment against him, on 11 charges, principally of a political nature and based chiefly on his alleged violation of the Tenure of Office Act. The event was considered so momentous that the Senate in accord with the conviction of the chief justice who presided, drew up and adopted its own formal rules of procedure.

On 23 March, the court of impeachment convened and the reply of the President was read by his counsel. He denied any intention of violating the Constitution, or of attempting to bring Congress into disgrace or to ridicule it. Testimony was taken and then the arguments of the attorneys were filed. Party excitement and passion ran high, and on 16 and 26 May, after a long trial, the Senate by a vote of 35 to 19 decided that he was guilty of the principal charges. This lacked one vote of the two-thirds majority necessary for conviction. (The court then adjourned sine die by a vote of 34 to 16). The necessary two-thirds was not obtained, largely because some of the leaders in the Senate feared that conviction might result in the permanent subordination of the executive to Congress. Seven Republican senators voted against conviction. The failure to convict was a public advantage, but the President did not win with dignity— for even while the trial was in progress he traveled about, making passionate speeches against Congress.

Charles Swayne, United States district judge for the northern district of Florida, was impeached on 24 Jan. 1905, under 12 charges, but was acquitted on 27 Feb. 1905.

The last instance of a Federal impeachment was that of Judge Robert W. Archbold, of the Commerce Court, who, on 13 Jan. 1913, on five out of 13 charges of high crimes and misdemeanors while in the discharge of his judicial duties, was found guilty by the United States Senate sitting as a high court of impeachment, and was sentenced to removal from office and disqualified forever for any office of honor, trust or profit under the government.

The most prominent recent case of State (Commonwealth) impeachment was that of Gov. William Sulzer of New York, in 1913. In this case, for the first time, was raised the question whether a public officer is liable to impeachment for acts committed by him before the beginning of his term of office. On 16 October the court of impeachment, including

members of the Senate and the judges of the Court of Appeals, found Governor Sulzer guilty of three of the eight charges (by a vote of 50 to 1), and voted to remove him from office, but did not prevent him from holding future office.

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47. THE PRESIDENT'S OFFICE. Origin and Early Development.—In theory the king of England was the model for the American chief executive. In fact, the framers of the Constitution were more influenced by such prototypes as the colonial governors and the official heads of the recently-formed States. but they did not make the chief officer of their "more perfect Union" a mere figurehead. This was in keeping with the reactionary spirit that characterized the entire movement for a new constitution. Its leading delegates were determined to have a single executive with adequate administrative powers. Having settled this point all the further details of the office required only careful adaptation and mutual compromise. The result formed such an important part of their labors that opponents styled the proposed frame of government "a monarchical constitution" and largely centred their attack upon the executive. But the "Federalist Papers" of Hamilton and his associates, and popular confidence in Washington, unanimously designated as chief magistrate, largely overcame this opposition.

Washington strove to give the office a broad national basis, but even he could not render it non-partisan. Foreign complications and the controversies over finance caused him and Adams to adhere to the policy of the Federalists. Yet Washington never abandoned a certain judicial poise, even when his Cabinet became the centre of partisan strife, and Adams did not hesitate to incur party defeat in ridding his Cabinet of factional elements. Jefferson administered affairs as a frank and fairly successful party leader. Much of his success was due to his conversational and epistolary powers, to which Cabinet and Congressional majority alike yielded. Under his weaker successors the Congressional caucus nearly destroyed executive independence. Our country was then struggling for full national recognition. English traditions in regard to public service were still strong and the candidate for high office must show his peculiar fitness for it. Such factors, combined with the waxing spirit of democracy, made mere tools of the weaker executives or aroused factitious opposition against the stronger ones.

Jackson's great work was to restore the office to a co-ordinate position with Congress and the judiciary. Utterly lacking in definite training, he was so thoroughly en rapport with dominant popular sentiment that he was able to force his will upon a hesitant Congress and to disregard Marshall's unacceptable decisions. He was aided in this result by the rise of the national convention, which destroyed the power of the Congressional caucus, and by the development of a party machine, based upon executive patronage and a subsidized press. The convention and party machine, however, made the future selection of second-rate party men almost inevitable. The predominance of domestic problems after Jackson's administration gave Congress further opportunity to control national policy. In some measure Polk showed how a successful war increased executive control, but it was under Lincoln that the war powers of the President reached their highest development. His successor, Johnson, was unable to maintain this high level and narrowly escaped conviction after impeachment by an encroaching Congress. The recurrence of domestic problems, largely of a materialistic type, gave Congress control in national affairs.

Recent Increase in Executive Power.—Cleveland ushered in a new group of strong executives, but he owed as much to the confusion of domestic politics as to his own native force. During his first administration Congress repealed the last of its restrictions upon the executive power of removal and established the succession to the Presidency upon its present basis. At the same time civil service reform and the tariff enabled Cleveland to assume a leadership that recalled the best efforts of Jefferson and Jackson. In his second administration he even challenged opposition within his own party upon the issues of free silver and the tariff and startled the conservative elements of the whole country by a new interpretation of the Monroe Doctrine.

Under McKinley our war with Spain served still further to emphasize executive leadership, especially in respect to new colonial possessions. The impetus thus given to executive power persisted in the problems connected with the Panama Canal and Latin America. Toward the latter our attitude has varied from a protectorate in Santo Domingo to a recognition of equality in the A. B. C. powers. In every instance this action has followed executive initiative, occasionally in default of action by Congress or the Senate, but those bodies subsequently, albeit grudgingly, ratified the President's action. Congress has even accepted without censure the existence of a state of war in Mexico and has tacitly followed the "gentlemen's agreement" with Japan on the immigration question. Other measures of Wilson, Taft and Roosevelt, touching the Far East, involved a punitive expedition in China, the "open door" in that country, intervention to end the Russo-Japanese War, the participation in and withdrawal from Chinese loans and moral support to the Chinese republic. Much of the initiative in these affairs is due to the acquisition of the Philippines and to the neces-

sary increase in executive authority while working out a colonial policy for those islands.

During the past 20 years the United States has gained greater influence in European affairs and a consequent increase in executive authority. American representatives were twice conspicuous at The Hague — on both occasions with hearty executive support. They even participated at the Algeciras Conference, although such action was contrary to traditional American policy. President Taft especially concerned himself to secure the adoption of arbitration treaties with the leading European nations, but was unable to overcome the opposition of the Senate to any fancied abrogation of its privileges. His attitude in foreign affairs did much to assert an executive independence that he otherwise abandoned. Wilson, confronted with a world war that recalls the previous contest against Napoleon, has handled the controverted issues thrust upon him with even greater freedom than his predecessors of a century ago and seems destined to open a new era in world diplomacy.

With a greater measure of executive control in foreign relations has gone an increasing leadership in domestic affairs. Both Roosevelt and Wilson have led their parties, although by divergent methods. Much of the popular demand for the reform legislation of recent years is due to executive guidance. The President has resorted more and more to direct popular appeal by voice and pen, and has thereby forced an unwilling Congress to carry out a party platform. He is thus becoming a real party leader, the one official chosen by the country at large, and chosen to carry out a definite party program, for which he assumes direct responsibility. President Wilson has shown this by reviving the custom of the two first Presidents in personally addressing both Houses of Congress; President Taft, by recommending a budget system for public expenditures. It is interesting to note that four of our recent Presidents, as well as Wilson, have in published works acknowledged this new measure of executive responsibility, although when in office they assumed it in varying degrees of independence and by diverse methods. The office of the President, no longer a mere negative influence in our government, has become a positive force for national guidance.

The Choice of President.— In the convention of 1787 the question of selecting the national executive presented numerous perplexities. The natural methods of choice — by the legislative assembly or by the people at large — were both rejected. The former was not in keeping with the rigid separation of powers that then seemed so necessary a doctrine, nor were the «Fathers» inclined to entrust the selection of so important an official to the general electorate. After passing over propositions to elect the Presidents by the suffrages of the State governors or by electors chosen by districts, the convention adopted an expedient suggested by the experience of Maryland. Each State should select Presidential electors equal in number to its senators and representatives. These electors, who supposedly would represent the intelligent people of the States, were to vote for two persons for President. A majority of all the electors would be necessary for a choice, the one receiving the highest number of votes becoming President and the next on the list the Vice-President. By 1800 the chief defect in this plan was revealed in a tie vote for Jefferson and Burr. Presidential elections had already become party affairs and this fact was registered in the speedy adoption of the 12th Amendment, under which the electors vote separately for President and Vice-President. By the original article of the Constitution the legislatures of the various States were to determine the method of choosing the electors; in the first election five legislatures did so without any reference to the people at large. By 1832 Delaware and South Carolina alone continued the practice and the latter held to it until 1860. In the election of 1876, the first in which it participated, Colorado also selected its electors through its legislature. Election by districts was employed by Massachusetts in 1788 and by four States in 1808. Maryland with the sporadic exception of Michigan, in 1892 was the last to abandon this system. After 1836 the practice of a popular choice of electors, upon a general State ticket, was in universal use outside of South Carolina. In 1845 Congress prescribed for the whole Union the present general election day. Since 1800 Presidential electors have been little more than recording agents in their respective States. To the States, however, the system gives a prominence and likewise a control in local suffrage that would be lost in an absolutely direct election. Occasionally the unpopularity of an individual elector, or some technical objection to his qualifications, may cause a split in a State delegation. In a close election, such as that of 1916, this may cause uncertainty in regard to the general vote.

Following the change in the electoral college came the Congressional caucus. This body, comprising the members of a given party in Congress, assumed the task of designating the candidates who should afterward receive the suffrages of the successful electors. At a period when party machines were new and undeveloped and communication difficult this body exercised a potent influence, not merely in naming the executive but in controlling his subsequent policy. It thus violated the cardinal principle of separating the primary functions of government and was contrary to the growing spirit of democracy. In 1824 similar bodies in each State legislature broke the power of the national caucus but only offered a multitude of weak initiations in its place. During Jackson's administration the national convention composed of delegates selected by State district conventions became the acceptable method of naming Presidential candidates. It has so continued to our own day, although in the last two elections «Presidential primaries» under State laws have often been used to select party delegates. As yet neither of the leading parties has made a serious attempt to adopt a national primary law.

Technically the President is not chosen until the counting of the electoral votes in February before the assembled Senate and House of Representatives. In 1800 an unsuccessful attempt was made to determine exactly what part each House should take in this ceremony, especially in case of a contested vote. In 1865 a

question arose over the returns from the "reconstructed" States of Tennessee and Louisiana. Congress hastily adopted the "Twenty-Second Joint Rule," which provided that each House should vote separately upon disputed election returns. This joint rule was suspended in 1877 by the famous "Electoral Commission," consisting of five members from the Supreme Court and five from each House. This commission passed upon the returns of each State and by a party vote seated Mr. Hayes. In order that such a dispute might not recur, Congress in 1877 determined by law to accept election certificates issued by accredited State officers. Each State thus has the power to determine its own electoral vote.

The Presidential Succession.— The Vice-President, chosen in the same manner as the President, succeeds him in case of the latter's death, disability or removal. Five of the 28 Presidents have reached the higher office through their predecessor's death. The succession was first regulated by the law of 1792, which provided that after the Vice-President the president of the Senate and in turn the speaker of the House might assume office for the sole purpose of ordering a new election. But during the intermission between two Congresses neither of these officials is in existence. Accordingly this method was superseded by the Act of 1886, which provides that in case both the President and Vice-President die or are removed, the Secretary of State should succeed, and after him, in order of seniority, the other members of the Cabinet.

Powers, Obligations and Privileges of the President.— Since 1909 the annual compensation of the President has been $75,000, with special appropriations for the care of the Executive Mansion. In general the life of a President is characterized by a simple dignity, although Presidents Roosevelt and Taft recently confessed that their movements while in office were restricted by necessary precautions for their safety. The first two Presidents attempted a series of stately public ceremonials, which their successors wisely abandoned. The President endeavors to keep in touch with public sentiment by frequent interviews generally due to executive initiative, with those who are supposedly able to give him first-hand information. Of late the Presidents have made frequent lengthy tours over the country, both to learn general views and to guide such views, into particular channels. Moreover the President may be influenced in regard to popular sentiment by the members of his Cabinet—his official advisers. But now the Cabinet official more frequently receives his views from the President than the reverse.

In the Constitutional Convention it was first proposed that the Cabinet should exercise a definite check upon the President but it was soon perceived that the power of the Senate over treaties and appointments was sufficient for this purpose. Washington consulted with his secretaries by letter, by personal interviews and in general meeting, but always reserved final decisions for himself. Jefferson at first affected a closer consultation with his Cabinet, with the idea of assuming only double weight in their joint counsels, but found that he could not escape ultimate decision for himself. Jackson frankly assumed a much more arrogant direction, and Lincoln, one as effectual, although pursued in a different manner. The present tendency is wholly in the direction of single executive responsibility in all affairs of great moment, although the President must entrust the multitudinous details of action to his subordinates.

The Act of 1789, creating the office of Secretary of State, gave the President the power to remove a subordinate without previously consulting the Senate. The only exception to the full exercise of this power occurred under the Tenure of Office Act, passed in 1867 to curb Johnson. Two years later the significant portion of this act was repealed and the remainder 3 March 1887. Although it served its purpose in affording a pretext to impeach Johnson, it never received judicial interpretation. As head of the army and navy the President exercises at all times an extensive appointing power. The Constitution permits Congress to vest the appointments for some minor offices in the heads of departments or their immediate subordinates. About five-sixths of the 340,000 odd Federal offices are under civil service rules. About 10,000 of the more important officials must be confirmed by the Senate and it is over this patronage that the President incurs trouble, if he does not give local influences due weight. Occasionally the Senate has requested additional information about the removal of an official before proceeding to confirm his successor. Cleveland took the position that this was not in keeping with public interests and consistently maintained his point. Jackson used the power of removal in building up a personal party machine, and his successors, including Lincoln himself, often had to follow his example. This abuse has been greatly curtailed since the passage of the Civil Service Act of 1883.

The President exercises a potent and increasing influence upon legislation. Legislative bills are frequently drafted by the departments directly interested in their passage. Certain attempts under Washington to have his Cabinet officers address the Houses directly were discouraged and not repeated. President Taft has expressed himself in favor of their appearance in Congress. The President exercises great influence through his messages or addresses to Congress, his veto power, his enormous patronage and above all, through his more clearly recognized position as party leader. Here his influence is both direct and positive. His veto power, a negative one, was copied almost verbatim from the Massachusetts constitution of 1780. In theory it means that its exercise equals the votes of a sixth of the senators and representatives, but in reality it is far more potent. The first six Presidents made rare use of the veto. Jackson found it useful in reasserting the co-ordinate power of the Presidency; Hayes used it to prevent "riders" on appropriation bills; Cleveland, more extensively than any other President, to defeat special pension legislation. The first two Presidents opened each Congress in person by a speech, and President Wilson has revived the practice with the published approval of his immediate predecessor. These messages or addresses have often proved influential in initiating legislation or in forcing

party issues. The growing power of administrative interpretation also makes the executive influential in legislation, especially that of a fiscal character. The judiciary must depend upon the executive or his subordinates for the enforcement of its decisions and in cases when executive discretion is involved must often yield to his immediate control. This interdependence not merely maintains the chief magistrate in a co-ordinate position, but frequently gives him temporary control of affairs. See EXECUTIVE; VETO; APPOINTMENTS TO OFFICE; TREATIES; CABINET AND CABINET GOVERNMENT; FEDERAL GOVERNMENT; CONSTITUTIONAL GOVERNMENT; CONGRESS; UNITED STATES — THE NEW DEMOCRACY AND THE SPOILS SYSTEM.

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48. THE VICE-PRESIDENCY. By provision of the Federal Constitution, a Vice-President of the United States is elected at the same time, for the same term and in like manner as the President by electors chosen in each of the States. A majority of the votes cast in the several electoral colleges is necessary to an election. The Vice-President is the president of the Senate, and in the event of an equal division in that body he gives the deciding vote. Under no other contingency has he a vote. The powers and duties of the office of President devolve upon the Vice-President in case of the death, resignation or removal from office of the President. The Vice-President is included in the category of public officers liable to removal from office on impeachment and conviction for treason, bribery or other high crimes and misdemeanors. By the 12th Amendment to the Constitution no person constitutionally ineligible to the office of President shall be elected to that of Vice-President. In the event of a vacancy occurring in the office of Vice-President, the Senate is presided over by a member of that body. In such contingency the death of the President would, under existing law, devolve the office of President upon the Secretary of State. Twenty-eight persons have held the office of Vice-President; their names and the dates of their respective elections are as follows, viz.: John Adams, of Massachusetts, elected in 1788, re-elected in 1792; Thomas Jefferson, of Virginia, in 1796; Aaron Burr, of New York, in 1800; George Clinton, of New York, in 1804, re-elected in 1808; Elbridge Gerry, of Massachusetts, in 1812; Daniel D. Tompkins, of New York, in 1816, re-elected in 1820; John C. Calhoun of South Carolina, in 1824, re-elected in 1828; Martin Van Buren, of New York, in 1832; Richard M. Johnson, of Kentucky, in 1836; John Tyler, of Virginia, in 1840; George M. Dallas, of Pennsylvania, in 1844; Millard Fillmore, of New York, in 1848; William R. King, of Alabama, in 1852; John C. Breckenridge, of Kentucky, in 1856; Hannibal Hamlin, of Maine, in 1860; Andrew Johnson, of Tennessee, in 1864; Schuyler Colfax, of Indiana, in 1868; Henry Wilson of Massachusetts, in 1872; William A. Wheeler, of New York, in 1876; Chester A. Arthur, of New York, in 1880; Thomas A. Hendricks, of Indiana, in 1884; Levi P. Morton, of New York, in 1888; Adlai E. Stevenson, of Illinois, in 1892; Garrett A. Hobart, of New Jersey, in 1896; Theodore Roosevelt, of New York, in 1900; Charles W. Fairbanks, of Indiana, in 1904; James S. Sherman in 1908; and Thomas R. Marshall in 1912.

Four Vice-Presidents were subsequently elected President, viz.: John Adams in 1796; Thomas Jefferson in 1800 and 1804; Martin Van Buren in 1836; and Theodore Roosevelt in 1904. The dates given have reference to the election by popular vote of the electors in the several States. Seven Vice-Presidents died in office, viz.: Clinton, Gerry, King, Wilson, Hendricks, Hobart and Sherman. In the Presidential contest of 1836 Martin Van Buren received a majority of the electoral votes for President, but no candidate received a majority for Vice-President. By constitutional requirement the duty of electing a Vice-President then devolved upon the Senate; the candidates from whom such choice was to be made being restricted to the two who had received the highest number of electoral votes. One of these, Richard M. Johnson, of Kentucky, was duly elected by the Senate. The only Vice-President who resigned the office was John C. Calhoun. This occurred in 1832, and Mr. Calhoun soon thereafter took his seat in the Senate, to which body he had been elected by the legislature of South Carolina.

Five Vice-Presidents have, upon the death of the President, succeeded to the Presidency. The first President to die during his incumbency of the great office was William Henry Harrison; his death occurred 4 April 1841, just one month after his inauguration. The Vice-President, John Tyler, then at his country home in Virginia, was officially notified of the event, and upon reaching the seat of government at once took the oath of office as President. There was much discussion for a time in and out of Congress as to his proper title, whether "Vice-President of the United States acting as President" or "President." The language of the Constitution, however, is clear, and it is no longer controverted that upon the death of the President the Vice-President becomes in name as in fact — President. Upon the death of President Zachary Taylor, 9 July 1850, Vice-President Millard Fillmore succeeded to the Presidency, and was at a later date an unsuccessful candidate for election to that office. The third Vice-President who reached the Presidency by succession was Andrew Johnson; this occurred 15 April 1865, the day following the assassination of President Lincoln. President Garfield was shot 2 July 1881 and died in September of that year, when he was succeeded by Vice-President Chester A. Arthur. Vice-President Roosevelt was the successor of

President McKinley, who died by the hand of an assassin in September 1901.

Two attempts have been made to secure the impeachment of the President; — the incumbent in each instance having been elected Vice-President, and succeeded to the higher office upon the death of the President. A resolution looking to the impeachment of President Tyler was introduced into the House of Representatives in January 1843, but being defeated no further steps were taken. Articles of impeachment for "high crimes and misdemeanors" were presented by the House of Representatives against President Johnson in 1868. By constitutional provision the trial was by the Senate, the chief justice of the United States presiding. Less than two-thirds of the senators voting for conviction, he was acquitted.

No constitutional provision existed until the adoption of the 12th Amendment for separate votes in the electoral colleges for President and Vice-President; the candidate receiving the highest number of votes (if a majority of all) became President, and the one receiving the second highest, Vice-President. In 1801 Jefferson and Burr each received 73 electoral votes, and by constitutional requirement the election at once devolved upon the House of Representatives, voting by States. Upon the 36th ballot, a majority of the States voting for Jefferson, he became President and Burr Vice-President. The constitutional amendment above indicated — by which separate ballots were required in the electoral colleges for the two offices — was the result of the intense excitement throughout the country engendered by this contest. The earnest opposition of Alexander Hamilton to Aaron Burr in the above-mentioned contest was the prime cause of the duel by which Hamilton lost his life at the hands of Burr, in 1804.

George Clinton, the fourth Vice-President, had as a member of the Continental Congress voted for the Declaration of Independence, and held the rank of brigadier-general during the War of the Revolution. The fifth Vice-President, Elbridge Gerry, had been a prominent member of the Constitutional Convention of 1787. William R. King, elected in 1852, by reason of ill-health never entered upon the discharge of the duties of his office. By special act of Congress, the oath of office was administered to him in Cuba and his death occurred soon thereafter. Of the 25 Vice-Presidents thus far elected, nine have been taken from the State of New York. Adams and Jefferson, the first and second Vice-Presidents, rendered valuable service to the young republic at foreign courts, each by election was elevated to the Presidency, and their deaths occurred upon the same historic 4 July — just 50 years from the day they had signed the Declaration of Independence. A marble bust of each of the Vice-Presidents has been placed in the gallery of the Senate chamber. The office of Vice-President is one of great dignity. He is the presiding officer of the most august legislative assembly known to men. In the event of an equal division in the Senate he gives the deciding vote. This vote, many times in our history, has been one of deep significance. It will readily be seen that the contingency may often occur when the Vice-President becomes an important factor in matters of legislation. See also UNITED STATES — PRESIDENTS AND VICE-PRESIDENTS OF.

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49. SPEAKER OF THE HOUSE OF REPRESENTATIVES. The Constitution of the United States provides that: "The House of Representatives shall choose a speaker and other officers, and shall have the sole power of impeachment." Even if the power to choose a speaker had not been expressly conferred by the Constitution, the House, as a legislative body, would have possessed the inherent authority to elect or appoint a presiding officer and such other officials as might be necessary to enable it to transact its business in an orderly and regular manner, and to make and preserve a record of its proceedings. As the Constitution does not prescribe the manner in which the speaker shall be chosen, the House itself must determine the mode of election, and, therefore, may order a vote to be taken in any way that will ascertain the choice of a majority, or the choice of a plurality, in case it shall have previously been determined that a plurality may elect. Although no rule has been adopted upon this subject, it is customary to choose a speaker by calling the names of the members present who have filed regular credentials with the clerk, and by recording their votes in the journal. Pending the election, the clerk of the last preceding House of Representatives presides, and it is his duty to preserve order and decorum and to decide all questions of order, subject, however, to appeal by any member. The speaker is nominally elected to preside during the Congress then existing, but there is no constitutional or statutory provision, nor any rule of the House fixing the term of office, and, as he is merely an officer of the House, it would seem that he might be lawfully deposed at any time by the election of another to take his place. By statute, in England, it is provided that, in case of a dissolution of Parliament, the then speaker of the House of Commons shall continue in office until one shall be chosen by the new Parliament, and that, in case of his death, disability or absense from the realm during any dissolution or prorogation, three of the commissioners of the House of Commons shall act for him in regard to the offices of the House. In this country, the office becomes vacant immediately upon the adjournment of Congress (see CONGRESS OF THE UNITED STATES), and there is no one authorized to act until a new speaker is elected by the next House, but as already stated, the clerk presides over the new House until a speaker is chosen. During the sitting of Congress the speaker may designate a member to discharge the duties of the office in his stead, but this substitution cannot extend beyond an adjournment. In case of his illness, however, he may, with the approval of the House, make such appointment for a period not exceeding 10 days; but, if he is absent and has omitted to make an appointment, the House elects a speaker pro tempore.

The speaker is nominated and elected by the members of the party with which he is affili-

ated, and the office is one of great political importance. His powers and duties differ in many respects from those appertaining to the office of speaker of the House of Commons, and he exercises much greater influence in directing the course of legislation and in political matters generally than the presiding officer of any other legislative body in the world. He not only presides over the deliberations of the House and preserves order and decorum, but until 1911 he appointed all standing committees and all select and conference committees ordered by the House, and, inasmuch as the member first named on the committee becomes its chairman, the speaker determined who should occupy all those important positions. In constituting the important standing committees, chairmanships are always given to members of the speaker's political party, and this is also generally the case in the appointment of select and conference committees. This power to appoint the standing and select committees is generally exercised by the presiding officers of legislative bodies in the United States, but it is not vested in the speaker of the English House of Commons or in the speaker of the House of Commons of the Dominion of Canada. Originally the House of Representatives appointed all the important committees by ballot, and the speaker appointed only such as consisted of not more than three members, an arrangement which confined his power to control legislation, otherwise than by the exercise of his personal and official influence, within very narrow limits as compared with the present system.

Until 1911 the speaker was chairman of the Committee on Rules, which consisted of himself and four other members, who were appointed by him. All proposed action relating to the rules, joint rules and order of business had to be referred to this committee for consideration and report, and it, therefore, practically decided what legislative measures should be taken up for consideration in the House, when they should be considered, what time should be allowed for debate and what amendments, if any, should be offered and voted on. However, in 1909 an attack on the arbitrary power of the speaker was instigated when the Democratic leader, Champ Clark, moved that the speaker should appoint committees only as instructed by the House, and that the Committee on Rules be enlarged to 15 members, elected by the House and be instructed to report at the following session upon the entire subject of rules revision. The proposal seemed too drastic and the final result was a motion proposed by John J. Fitzgerald of New York freeing members "somewhat of the necessity of 'seeing the speaker' before offering motions." However, on 19 March 1910 the attack was renewed by George W. Norris of Nebraska, who introduced a resolution to increase the Committee on Rules from 5 to 10, to provide for their election by the House and to exclude the speaker from membership. This brought on a heated conflict, the Democratic and insurgent Republicans joining forces; but owing to a tactical mistake, Joseph G. Cannon, against whose arbitrary actions the resolution was mainly directed, weathered the storm. But in 1911 when the Democrats gained control of the House they signalized their victory by stripping from the speaker the power of appointment of all remaining standing committees and vesting this function in the Ways and Means Committee subject to the ratification of the House. By so doing the House secured greater control of its affairs "than it had exercised at any time since the Civil War." The Committee on Rules has since been raised from 10 to 11 members.

The speaker must rise from the chair to put a question to the House, but he may state it sitting. There are four different methods of taking the sense of the House on a pending proposition: First, by the voices, the members who vote in the affirmative saying "Aye," and those voting in the negative saying "No." If the speaker doubts, or if a division is called for, he directs those in the affirmative to rise from their seats and be counted, and after he has made the count and announced the number, those voting in the negative rise and are counted. If he still doubts, or if tellers are demanded by one-fifth of a quorum, the speaker designates two members, one from the affirmative side and one from the negative side, to count the votes for and against the measure and report the result to him. Even after all these methods are resorted to, if the yeas and nays are demanded by one-fifth of the members present, the speaker directs the clerk to call the roll, and the names of those voting are entered on the journal. It is frequently the case that the votes are taken in all these different ways upon the same question before the result is finally ascertained and announced.

When the House resolves itself into a committee of the whole, the speaker leaves his place and designates a member to preside as chairman. In case of disorder in the committee, the regular practice is for the committee to rise by vote and report the fact to the House, but there have been occasions when the speaker, having knowledge of the disorder, has summarily resumed the chair and restored order without the formality of a vote by the committee to rise and report.

It is the duty of the speaker to sign all acts, addresses, joint resolutions, writs, warrants and subpœnas ordered by the House, and to decide all questions of order as they arise, subject to appeal by any member. Being a representative himself, he has the right to vote on all questions in the House and in committees of the whole, but, under the rules, he is not required to vote in ordinary legislative proceedings, except in case when his vote would be decisive or when the House is voting by ballot. When there is an even, or tie, vote, the question is lost, and the speaker, therefore, does not vote unless he is in favor of the measure. According to the general parliamentary law, the speaker has no right to speak except on questions of order, but, in the House of Representatives, he has several times participated in the debates without asking the consent of the House; and it is not unusual for him to speak and vote in committees of the whole.

He is required to take the chair on every legislative day at the time to which the House shall have adjourned at its last sitting, and, on the appearance of a quorum, it is his duty to cause the journal of the last day's proceedings to be read, having first examined and approved it. Generally, however, the reading of

the journal is dispensed with by unanimous consent of the House. If no quorum attends at the hour of meeting, or if it appears at any time during the sitting that no quorum is present, he has no power to adjourn the House on his motion, as is the case in the English House of Commons. Under the Constitution, a majority of the House constitutes a quorum to do business, but it is provided that a smaller number may adjourn from day to day and may be authorized to compel the attendance of absent members, in such manner and under such penalties as it may prescribe. Accordingly, it is provided by rule that 15 members, including the speaker, shall be authorized to compel the attendance of absent members, and, consequently, the House is not disabled and forced to adjourn because there is no quorum present.

The speaker has the power to appoint and remove for cause the official reporters of debates for the House, and he prescribes regulations for the admission of the representatives of the press to the reporters' gallery. He has also control over the hall of records and the unappropriated rooms in that part of the Capitol assigned to the use of the House. Under the statutes of the United States he appoints from the membership of the House three visitors to the Military Academy, three to the Naval Academy, a consulting trustee of the Reform School of the District of Columbia, two directors of the Columbia Hospital for Women, three regents of the Smithsonian Institution and two members of the Memorial Association of the District of Columbia.

Since the organization of the government under the Constitution, on 30 April 1789, there have been 65 Congresses, but owing to the fact that in many cases the same person was several times re-elected to the office, there have been only 35 permanent speakers of the House. Of the 35, four were representatives from Massachusetts, four from Virginia, four from Kentucky, three from Pennsylvania, three from Indiana, two from New Jersey, two from South Carolina, two from Georgia, two from Maine, two from Tennessee, and one from each of the States of Connecticut, North Carolina, New York, Ohio, Iowa, Illinois and Missouri. The speaker who held the position longer than any other was Henry Clay of Kentucky, who was elected six times; but he did not serve six full terms, having resigned from the office twice before the expiration of the Congresses for which he had been chosen.

Under the Constitution, Congress may provide by law for the case of removal, death, resignation or inability, both of the President and Vice-President, designating what officer shall then act as President, and, by a statute passed 1 March 1792, it was enacted that in such a case the president of the Senate, or, if there should be none, the speaker of the House, for the time being should act as President until the disability should be removed or a President should be elected. This statute remained in force until 19 Jan. 1886, when Congress passed another act providing that in case of the removal, death, resignation or inability of both the President and Vice-President, the Secretary of State, or, if there should be none, or in case of his removal, death, resignation or disability, the Secretary of the Treasury shall act as President, and that the right of succession shall pass next to the Secretary of War, then to the Attorney-General, Postmaster-General, Secretary of the Navy and Secretary of the Interior. The Department of Agriculture and the Department of Commerce and Labor had not then been created, and, consequently, the secretaries of these departments are not included in the act and they are not in the line of succession. Although the Act of 1792 remained in force for nearly 95 years, the contingency provided for never occurred. This was fortunate for the country, because there were grave doubts as to its constitutionality, and, if the offices of both President and Vice-President had at any time become vacant, the succession of the president of the Senate or the speaker of the House might have been seriously contested. The questions which would have arisen are: (1) Whether the word "officer" used in the Constitution did not mean an officer of the United States; and, if so (2) whether the president of the Senate and the speaker of the House are such officers or are only representatives of the States or the people, chosen by the two branches of Congress to preside over their deliberations.

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50. HISTORY OF ARBITRATIONS. International arbitration is a voluntary submission of certain definite points in an international dispute to the decision of a third party. (The decision of the arbitrator or court of arbitration is binding except when the award is outside of the points submitted, equivocal, impossible, influenced by fraud or corruption, or a denial of justice). It is largely the outgrowth of the complex international relations of the 19th century which have resulted in a growth in the recognition of international duties and liabilities. From 1800 to 1900 there were 136 important international arbitrations and many minor commissions.

The United States, pre-eminent in the advocacy of arbitration between states, took the lead in several very important international adjustments. She began her national existence with many unsettled questions, and as she settled them there arose many new problems demanding solution. With a desire to substitute reason for force in settling disputes, she accepted international arbitration as a prominent feature of her policy. Her arbitrations embraced many kinds of international controversy, and many important questions of law, both public and private, some of which might have resulted in expensive wars.

I. The chief arbitrations of the 19th century to which the United States was a party can be only briefly summarized here.

With Great Britain.—Arbitrations with Great Britain were the most important. The first

cases arose under the Jay Treaty of 1894, articles 5, 6 and 7 of which provided for three mixed commissions: (1) To settle the identity of the Saint Croix River, which was specified in the treaty of 1783. The commission in 1798 decided upon the Schoodiac. (2) To decide what compensation, if any, was due British subjects who had been unable to collect debts in some of the States where the terms of the treaty of 1783 had been disregarded. The board of five arbitrators met at Philadelphia in 1797, quarreled and adjourned in 1798. The matter was finally settled by the treaty of 1802 which awarded Great Britain £600,000. (3) To settle questions regarding contraband, rights of neutrals and prize court decisions. This commission met at London. There were several interruptions (and the disagreement of the Philadelphia commission caused a suspension from July 1799 to February 1802), but it completed its work in 1804. Its work was very important in determining subsequent international law (q.v.).

After the cases wisely provided under the Jay Treaty, there followed a period in which the effects of European wars rendered arbitration practically impossible, and produced an extraordinary train of circumstances which finally precipitated the Anglo-American War of 1812. Since that war every vexatious question which has arisen with Great Britain has been settled by arbitration in case direct negotiation failed. Articles 4, 5, 6 and 7 of the Treaty of Ghent of 1814 provided for three commissions or boards of arbitration: (1) To determine the title to certain islands in Passamaquoddy Bay. At New York, in 1817, the board made its award, substantiating in the main the British claims. (2) To determine the northeast boundary of the United States, from the source of Saint Croix to the Saint Lawrence. The board met at Saint Andrews in 1816, and held its last meeting at New York in 1822, but reached no agreement. By a convention of 1827 the points of difference were referred to the king of the Netherlands, who, in 1831, proposed a compromise line which neither party was willing to accept. The matter was finally settled by the Webster-Ashburton Treaty of 1842. (3) To determine the boundary through the middle of the lakes to the upper end of Lake Huron and then to the Lake of the Woods. The commission agreed upon the first part in 1822 and finally adjourned in 1827, leaving the boundary westward from Lake Huron through Lake Superior to the Lake of the Woods unsettled till the Webster-Ashburton Treaty of 1842.

By the treaty of 1818 the question in dispute as to the obligation of Great Britain to return the slaves which she had in her possession at the time of the signature of the Treaty of Ghent was referred to the emperor of Russia who in 1822 decided that Great Britain had not complied with the Treaty of Ghent, and that she should pay to the United States an indemnity. The mixed commission which was selected to fix the amount of compensation finally agreed on most points, but adjourned in 1827, its functions having been ended by the ratification of a convention concluded at London in 1826 by which the United States received $1,204,906.

A convention at London in 1853 provided for a claims commission which ended its sessions in 1855, after giving important decisions regarding fishery rights and rendering awards in the famous McLeod and Creole cases. The reciprocity treaty of 1854 provided a commission to adjust disputes regarding fishermen which might arise under the treaty, but no resort was made to the stipulation. In 1855 a commission was organized to determine the reciprocal reserved fisheries rights, under the reciprocity treaty, which had renewed the privileges renounced by the United States in the convention of 1818 as to in-shore places. The work was concluded in 1866.

In 1857 commissioners were appointed to determine the boundary under the treaty of 1846, there having been a disagreement in regard to the San Juan water boundary — as to the middle of the channel separating Vancouver's Island from the continent. They held six informal meetings in 1857 and finally disagreed. Discussion of the boundary continued until the Civil War, and was resumed in 1866. The Senate failed to vote upon the convention of 1869 for the submission of the question to the arbitration of the President of the Swiss Confederation. Under the treaty of 1863 commissioners were appointed to settle the claims of the Hudson's Bay Company (q.v.) and the Puget Sound Agricultural Company arising under the Oregon treaty of 1846. In 1869 they awarded $450,000 and $200,000, respectively, to the companies, which in turn executed deeds relinquishing all claims.

The greatest arbitration treaty was that of Washington (1871) which provided for four distinct arbitrations: (1) The question of the San Juan water boundary was referred to the emperor of Germany who in 1872 rendered an award in favor of the American claim to the Haro Channel. (The boundary was fixed by protocol in 1873). (2) The American claims for losses from Confederate cruisers of British origin (Alabama claims, q.v.) were referred to the Geneva tribunal, which in 1872 awarded $15,500,000 to the United States. (3) The claims and counterclaims growing out of the Civil War (outside of the cruiser claims) was referred to a mixed commission which in 1873 awarded Great Britain $1,929,819. (4) The claims for American use of the northeastern fisheries (of Nova Scotia) were referred to a commission of three persons which met at Halifax in 1877 and awarded $5,500,000 to Great Britain.

Under a treaty of 1892, a commission was created to settle the Bering Sea controversy (q.v.) as to sealing. It met at Paris in 1893 and decided that the United States can claim no exclusive rights in sealing in Bering Sea except within three miles of the coast of her territory, though it favored the American plea for the necessity of regulating pelagic sealing. Under the decision of this commission, there was created a new commission (1896) which awarded $471,151 to the Canadian sealers whose vessels had been seized. In 1897 the question of the boundary between Alaska and the British possessions was submitted to a board of arbitration. After considerable delay, the arbitrators met at London (1903) and decided the

main points in favor of the American contentions.

There were two important Anglo-American cases in which a third party was involved: (1) Under a convention of 1889 between the United States, Great Britain and Germany, to settle conflicting interests in the Samoan Islands (q.v.), the nomination of the chief justice of the islands was to be referred to the king of Sweden in case the three powers could not agree. In 1899 a joint high commission, which was sent to investigate the complications which had arisen, decided that a partition of the islands between the United States and Germany was the best solution of the problem. An agreement for partition was signed at Washington in December of the following year. (2) In 1890 the United States, Great Britain and Portugal agreed to submit to three eminent jurists, to be selected by the President of Switzerland, the settlement of a dispute caused by the seizure and the annulment of the charter (by Portugal) of the Delagoa Bay Railway, which had been constructed under a concession to an American.

Among the more important American arbitrations with other nations in the century before 1900 are the following:

With Spain.—A commission, under article 21 of the treaty of 1795 with Spain provided for a commission which met at Philadelphia in 1797–99 and awarded $325,440 to the United States for depredations on American commerce before 1794. To settle spoliation claims arising after 1795 a commission was appointed in 1802, but the provisions governing it were rejected by the United States. Diplomatic relations which were suspended in 1805 were resumed at the close of the Napoleonic wars and resulted in the Treaty of Florida, in 1819, by which all claims were adjusted. In 1870, on the suggestion of Secretary Fish, the case of the *Colonel Lloyd Aspinwall,* an American vessel seized near Cuba by the Spanish authorities, was submitted to a board of arbitration which met at New York in the same year and awarded $19,702 to the United States. By an agreement of 1871 a mixed commission was created to adjust claims resulting from the Cuban insurrection. It met at Washington and concluded its labors by February 1883. In 1885 the question of damages for wrongful seizure and detention of the American bark *Masonic* was referred to Baron Blanc, the Italian Minister at Madrid.

With France.— The United States and France did not succeed so well in settling their disputes by arbitration. In 1800 they agreed upon a convention for settling disputed claims for depredations after 1788. France did not carry out faithfully her part of the agreement, but in 1803 she concluded another convention providing a commission and the payment of claims. Subsequent depredations produced new claims which France delayed to pay. In 1831 these claims and French counterclaims were adjusted by a commission which awarded the United States an indemnity of $5,558,108. The delay of France in paying led to a rupture of diplomatic relations, but through the mediation of Great Britain in 1836 the claims were paid. In 1880 a board was created to adjust the claims growing out of the Mexican troubles of 1862–67, the American Civil War and the Franco-German War (q.v.). It completed its work in 1884 and awarded $612,000 to France.

With Mexico.— By the treaty of 1839 with Mexico, the adjustment of miscellaneous claims was submitted to a mixed commission, composed of two Mexican commissioners and an umpire (a citizen of Prussia). In the treaty of 1848 the United States and Mexico agreed to submit all disputes to arbitration, and in 1868 they provided for the settlement of all claims after 1848 by a joint commission which held its first meeting in 1869 and finally completed its work in 1876. The award was in favor of the United States ($4,125,622 in favor of citizens of the United States and $150,498 in favor of citizens of Mexico), but Mexico delayed final settlement, claiming that the award was unjust. Under the convention of 1889 (and in harmony with the arbitral boundary stipulations of the treaties of 1828, 1853 and 1882) a permanent board, called the International Boundary Commission, was established to determine questions arising from changes in the course of Rio Grande and the Colorado rivers along the boundary between the United States and Mexico.

With Venezuela.— In 1866 a mixed commission was created to settle American claims against Venezuela. In 1868 it awarded $1,253,310 to the United States. Fraud being charged, the claims were finally (1885) submitted to a second commission which in 1890 awarded $980,572 to the United States. Another claims case with Venezuela was that of the Venezuela Steam Navigation Company in 1892.

Among other cases arbitrated were the following: Claims for the brig *General Armstrong* in 1851 (with Portugal); Panama riot claims, in 1857–62 (with New Granada); claims for the brig *Macedonia,* 1858–63 (with Chile); claims for the United States and Paraguay Navigation Company, 1859 (with Paraguay); claims against Costa Rica, in 1860; claims against Ecuador, in 1862; Colombian claims of 1861 and of 1864; Peruvian claims, 1863 and 1868–69; claims for the steamer *Montijo,* 1874 (with Colombia); Pelletier and Lazare claims, 1884 (with Hayti); Bokkelen claims, 1888 (with Hayti); the Carlos Butterfield claims, 1888 (with Denmark); Chilean claims, 1892–94; the Santos claims, 1893–96 (with Ecuador).

The Russian seal cases, resulting from the seizure of four American vessels in Bering Sea, in 1891, by a Russian cruiser, was (by protocol of 8 Sept. 1900) submitted to the decision of an arbiter who in 1902 gave a decision awarding $114,670 in favor of the United States.

In addition to submitting its own cases to arbitration, the United States through its officials (the President and diplomatic representatives) in the latter part of the 19th century acted as arbitrator in several cases. She has acted as mediator in numerous cases, the most important being to secure an armistice between Spain and the several trans-Andean South American countries in 1871, and in adjusting a long-standing boundary dispute between Chile and the Argentine Republic in 1881. Her government has often created tribunals, under her own statutes, to execute conventional obligations and to settle questions of international relations.

In the same period there were many memorials and petitions presented to Congress on the subject of international arbitration. In 1874 a resolution in favor of general arbitra-

tion was passed by the House. In 1888 the President and Congress received a communication signed by 233 members of the British Parliament urging the negotiation of an arbitration treaty. In 1883 Switzerland proposed to the United States the inauguration of international treaties providing for arbitration. The President of the United States assented to the proposal. In 1890 the Senate (the House concurring) adopted a resolution in favor of arbitration. Negotiation between the United States and Great Britain for a general and permanent treaty of arbitration soon followed, and in 1897 a treaty was concluded and sent to the Senate by President Cleveland. President McKinley also urged its ratification, but it failed to get the necessary two-thirds vote. Meantime a general treaty of arbitration for American republics, drafted at the first Pan-American Conference of 1889–90, lapsed and never was ratified. The United States, however, became a party to The Hague Convention, adopted at The Hague Peace Conference 29 July 1899, which resulted in the establishment of The Hague permanent court — the crowning event of the 19th century in arbitration.

II. The creation of The Hague Court marked the beginning of a new period of increased interest in arbitration. To this tribunal reference (voluntary or compulsory) of all questions of claims for arbitration was favored by the second Pan-American Conference (at Mexico, 1901–02). Its first case, the controversy between the United States and Mexico over the famous Pious fund of the Californias, was satisfactorily settled in 1902 and gave dignity to the court, attracting the confidence of other states and resulting in the early submission of other international disputes for its decision. Its next important case was the Venezuela trouble of 1903, in which four nations were involved, and which was submitted to arbitration through the influence of President Roosevelt, who had prevented Germany's plans of using force against Venezuela. In 1910 it settled by arbitration the claims of the Oronoco company resulting from concessions annulled by President Castro of Venezuela — claims which had been arbitrated in 1903 but were resubmitted on the ground that the umpire had disregarded the terms of the protocol submitting the case for his decision and award. In the same year it made a satisfactory award in the Anglo-American North Atlantic Coast Fisheries controversy, involving an interpretation of the treaty of 1818, submitted to it by special Anglo-American agreement of 1909.

The second Hague Conference (1907), called at the initiation of President Roosevelt, enlarged and strengthened the convention of 1899 for the settlement of international disputes. It provided that, in case either government party to a dispute should decline to arbitrate when requested to do so, the other party might go directly to the bureau of The Hague Court and publicly request arbitration of the controversy. Through the influence of the American delegates it also drafted a convention which prohibited the use of force for collection of contractual debts from debtor nations before an attempt at arbitration. It also strengthened the provisions for the creation of commissions of inquiry and approved the principle of obligatory arbitration. The American proposition for a form of treaty for obligatory arbitration, stipulating that certain classes of controversies should go spontaneously (automatically) to The Hague Court, received the vote of 35 of the 44 delegations, but was opposed by Germany and four other powers (Austria, Greece, Rumania and Turkey). The conference also took another advanced step in voting unanimously for a regular international court of justice with judges in permanent service and holding regular sessions, but it failed to find a method of appointment of judges satisfactory to all the powers, great and small.

A Central American Conference which convened at Washington in 1907, largely through the influence and initiative of President Roosevelt, resulted in the foundation of a Central American court for the arbitration of questions of an international character affecting the relations of the five republics.

New efforts for treaties of obligatory arbitration with stipulations for reference of controversies to the new Hague tribunal were remarkably successful — although Secretary Hay's general treaties of 1904–05, providing for arbitration of judicial disputes and questions of treaty interpretation by The Hague by special agreements by the executive without reference to the Senate, failed because of Senate amendment. No less than 51 such treaties were signed before June 1907, and the number after 1907 was increased by 1910 to about 80, of which 24 were negotiated by Secretary Root before January 1908, each providing for approval of special agreements by the Senate, and in February 1909 were all ratified by the Senate. These treaties, terminating after five years, provided for reference of questions of a judicial nature and those regarding the interpretation of treaties, but excluding questions affecting vital interests and honor.

The application of the principle of arbitration in international relations was made in the establishment of two tribunals to decide controversies arising between the United States and Canada: one, a permanent international fisheries commission (by treaty of 1908) to settle fishing difficulties; and the other an international joint waterways commission (by treaty of 1909) for exercise of jurisdiction in cases involving the use, obstruction or diversion of boundary waters, and with authority to inquire and report concerning other matters of difference or dispute along the frontier or to decide such questions as might be referred to it.

More comprehensive arbitration treaties with England and with France, providing for submission to The Hague of all justifiable questions arising from claims of rights under treaty or otherwise, and also the creation of joint high commissions of inquiry to which any controversy might be submitted for investigation and report before submission to arbitration, were signed in August 1911, but emasculated by the Senate in March 1912 and finally abandoned.

Secretary Bryan proposed that the principle of international commissions should be extended to *all* questions, with a provision that no war should be commenced during investigation. His plan was to supplement the arbitration treaties with a new set of agreements providing for commissions of inquiry (five members) to which all questions (after a diplomatic failure)

would be submitted for investigation and report, delaying for one year any preparation for hostilities or declaration of war. The plan was promptly approved by 31 nations but was interrupted by the World War in 1914 after a score of such treaties had been signed.

During the war the decline of national interest in arbitration treaties was coincident with an increasing interest in a League of Nations which became the dominating idea in the peace negotiations at Versailles in 1919, and which emphasized the necessity of an international court to execute international judgments and to maintain peace.

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51. GROWTH AND DEVELOPMENT OF LAW. The history of law, or the relations of members of society to one another and of all to the State, is a history of organic growth. Upon it various phases of political, social and economic activities of a people have left indelible traces. The history of American law is from the beginning somewhat complex, but it represents the development of legal principles in the feeble and scattered colonies of the 17th century into the diversified yet systematic body of law in force to-day in a nation whose inhabitants differ in their various needs as widely as they are distributed geographically. The heterogeneous character of administration in the various colonies, the organic change from British colonies to independent states, the welding of the separate States into a national union, the taking-over of certain legal powers and duties by the Federal government under the Constitution and the consequent growth of a Federal jurisprudence, partly opposed and partly complemental to that of the States, the addition of new Territories by conquest and purchase, each in turn becoming States under the Constitution, —all these have been factors in producing the differentiated body known as American jurisprudence. In order to understand the development of American law, its history may be divided roughly into four periods: (1) The period of settlement, extending through the 17th century; (2) The period of organization, covering the 18th century to the Revolution; (3) The period of extension, from the Revolution to about 1850, and (4) The period of modern law and procedure from about 1850 to the present time.

The Period of Settlement (1607–1700).— The year of the settlement at Jamestown, Va., was also the year of Calvin's Case (7 Coke's Reports, 17), which upon a state of facts quite disconnected from colonial matters laid down the theory of the English courts as to the position of dependencies. This was that English statutes did not bind dependencies, as parcels of the realm in tenure, unless they were specially named. At a later time in the cases of Blankard v. Galdy (2 Salk. 411) and Campbell v. Hall (1 Cowper, 204) this principle was more elaborately developed, and Blackstone lent to it the weight of his authority. That English subjects going to a new and uninhabited country carried with them, as their birthright, the laws of England existing at the time of colonization, was a supplemental corollary of the former principle. While such was the theory accepted by English courts, it does not follow that during the colonial period it was adopted in its entirety by the colonists themselves.

The English settlements in America varied so much in their origin and spirit that at first no general legal principles were consciously adopted. The early London Company which exploited Virginia had few purposes in common with the Puritans who aimed at a theocratic form of government in Massachusetts. Their different aims were apparent in the laws adopted for the regulation of the colonies. Nowhere were trained lawyers to be found among the early settlers, and the profession of law was not only held in no esteem, but the lawyer was for a long time denied the privilege of practising for hire. This distrust of the legal profession was under the circumstances not unnatural. Lawyers were a recognized caste in England. The common law of England in the early 17th century had become harsh in its methods, rigorous in its procedure, and technical in its practice. It was founded upon precedents which grew out of old social and religious conditions with which the emigrants not only had little sympathy but from which they had also sought to escape. The settlement of hitherto unoccupied territories made necessary a new order of things in which were erected new institutions fitted to a scattered population, a rude society, and a simple economic system. All of the colonists had, however, as a part of their English birthright and inheritance, certain deeply-rooted traditions which included a knowledge of and reverence for the great principles of the English common law, which assured the fundamental rights of person and property, which are the landmarks of English constitutional liberty. Familiar with representative government, they brought with them belief in the adequacy of statutes as a means of bringing law into conformity with the needs of society. Moreover, some notion of the orderly arrangement of statutes into codes was not wanting to the settlers. At the beginning, therefore, dependence was placed upon statute law to the exclusion of judge-made law. Such dependence is to be explained by the new conditions in which the colonists were placed, their distance from the mother-country, and the absence of trained lawyers.

The radical differences in the character of the colonists were reflected in their statutory

enactments. The theocracy of Massachusetts found expression in the Body of Liberties (1636) in which the Mosaic Code was adopted. The Connecticut Code (1643) was similar. The early code of Virginia (1612) was exceedingly severe and it was modified soon after the colony had its own legislative assembly. The commercial spirit of the colony's promoters asserted itself in the laws which aimed at the economic regulation of the colony. While the criminal codes, judged by the standards of the present, seem harsh, yet in comparison with the criminal law of England, they were mild, for while the laws of Connecticut specified 12 crimes for which the death penalty was provided, there were more than 200 offenses punishable by death under the English law. No other colony introduced a system of codes so all-embracing and modern in spirit as did Pennsylvania, which by its frame of government and fundamental laws embodied the opinions of the most enlightened statesmen of the time with the modifications which experience had found necessary. In Maryland, owing to the continued disagreement between the proprietors and the people, no formal code of laws was in force. The colonists accordingly claimed that they were governed by the common law of England in so far as it was applicable to the local conditions existing. The proprietor opposed this claim as in derogation of his rights and the controversy was not settled until well into the 18th century.

The almost universal adoption of codes which restated legal principles remained to be put in force by the colonial courts. The constitution of these courts was as various as was that of the colonies. Everywhere the trial courts were presided over by men untrained in the law; the procedure was of the most informal kind. Whether, as in Virginia, the County Court consisted of 8 or 10 gentlemen holding commissions from the governor, or as in Rhode Island, where the judges were elected annually by the people, there was little chance for a systematic declaration of the law based upon precedent. It is the universally accepted theory of American jurisprudence that the colonists brought with them such parts of the unwritten common law of England as was suited *mutatis mutandis* to the conditions of colonial life. No exact dates, however, can be set for a general reception of the common law. Where the colonial codes were silent the early colonial judges did not consciously draw upon English precedents for their decisions. Knowing little and caring less for the technicalities of the law and having no law books, they decided cases not covered by the codes according to the rules of substantial justice as between man and man, taking as in Massachusetts (1646) "the words of eternal righteousness and truth as the rule by which all kingdoms and jurisdictions must render account," or, as in Virginia (1631) "doing equal right to poor and to rich after their cunning, wit and power and after the laws and customs of the colony and as near as may be after the laws of England." While the systems of grand and petit juries were everywhere to be found, their powers differed from their English originals; the respective provinces of the court and petit jury were not clearly defined. Contrary to the English practice, evidence was frequently submitted in writing; pleading was according to no rule, and while the terminology of the common law was used, the precise meanings of legal phrases were overlooked. Peculiarly English provisions were modified or abrogated. The theory of feudal tenures was abolished save in those colonies, as in Maryland, where the proprietary system prevailed. Primogeniture had no existence in Massachusetts, Connecticut or Delaware and the eldest son was given a double portion in lieu thereof. Appellate procedure was as informal as was that of the trial courts. Usually the method was by appeal to the governor and council, not upon reserved questions of law, but by a review of the whole case upon its merits. Appeals beyond the highest authority in the colony to the king in council were generally and successfully denied by the colonial governments.

In the founding of separate colonies, distinct in character one from another, by resourceful and self-reliant Englishmen were the beginnings of American jurisprudence. The "wise and salutary neglect" of the mother-country did much to make early American law peculiar to itself.

Period of Organization (1700–1776).— During the 18th century and prior to the Revolution, law and procedure tended toward a common type in all the colonies. The causes of such a change from the variant beginnings of the century previous were not only political, but social and economic. Increase of population by immigration, mostly from England and by natural increase, added wealth, growth of towns and better facilities of inter-communication rendered the crude administration of the earlier period insufficient for colonial needs. The revocation of colonial charters and the organization of Crown colonies led the way to greater uniformity of administration. Common grievances started a national feeling. All of these forces aided in creating a common public sentiment which found its expression in law either directly through legislation or indirectly from the bench. During this period were laid the foundations of a later constitutional law. Every inhabitant of a charter colony was interested in the legal proceedings in England concerning the charters, in which were involved definite and fundamental principles of public law. Furthermore, sentiment in these colonies agreed that if a colonial legislature enacted laws not in accordance with the powers granted by charter, the act was void. Familiarity with colonial charters bred a belief in the wisdom of written constitutions; and the practice of declaring void all legislative enactments in conflict with charter powers assisted in building up the later theory of constitutional limitations, State and Federal.

As a part of the political education of the period was the growing conviction, long held by Maryland, that the common law of England, modified in certain matters by Parliamentary enactments, was the supreme law; that it was one and the same for each colony and that by means of it everyone was guaranteed in his rights as an Englishman. Appeals to England, which at an earlier time had been discouraged, were now claimed as a matter of right, so that if a colonial court failed to declare the law in accordance with the common law, an English court of appeal had jurisdiction to remedy the error. As the judges in the Crown colonies

were appointed during good behavior and tended, therefore, to hold to prerogative, their decisions in matters of public right were apt to be unpopular.

The appearance of trained lawyers and the removal of the ban placed upon the legal profession had much to do with the change in procedure. Local prejudices and slip-shod methods of practice gave way before a regulated system based upon the common law. Not until the second half of the 18th century, however, was the American lawyer a person of great public influence. The generation which stood for political independence and furnished men of affairs was one of lawyers. English lawbooks and reports were imported. Procedure was copied from that obtaining in the English courts. Pleading according to the rules of the common law was introduced with all the old technicalities.

Holding by commission from the Crown, the colonial governor assumed to a greater or less extent the functions of a chancellor and gave relief in equity. As the governor derived his chancery powers from the king, recourse to him was never popular. While in England equity had become an independent system under the chancellorship of Lord Hardwicke (1736–56), in the American colonies the chancery courts remained in a rudimentary state. In every colony, however, there was a court having a semblance of chancery powers. Pennsylvania adopted in her early codes a system unique in the history of jurisprudence, in that in the courts of the colony, having both law and equity powers, equitable rights were administered under common-law forms.

The period may be characterized as one in which courts were organized as far as possible like those of England, rendering decisions according to the common law, introduced by lawyers and welcomed by the people as a part of their liberties. The uniform character of the common law superseded local custom as far as practicable, while the earlier colonial codes covering many matters of criminal law and necessarily local economic regulations remained in force.

The Period of Extension (1776–1850).—The legal changes entailed by the War of Independence were largely of a constitutional character, a discussion of which is beyond the scope of the present article. The ideas of which the Revolution was the outgrowth contributed vastly to the development of an American jurisprudence sufficiently distinct from that of England and of the later colonial period as to be a separate system. Speculative writers like Montesquieu, Burlamaqui and Vattel exerted an influence which was apparent not only in matters of constitutional organization but also in the habits of thought of the American bar. Of the 56 signers of the Declaration of Independence 35 were lawyers. The American nation began not so much with the promulgation of a revolutionary manifesto as by a declaration of principles of natural law, the fruit of American legal minds. It is of no little significance that more copies of Blackstone's 'Commentaries,' the first systematic exposition of English law, were sold during the 18th century in America than in England.

Independence brought about a change in the fundamental organization of every State. Each adopted a written constitution or (as in Rhode Island and Connecticut) continued in force its colonial charter as a sufficient declaration of constitutional matters, and in each it was necessary to construe them. Experience and theory left such construction to the courts and the supreme rule which guided was that of the common law. In every State varying written constitutions construed according to the principles of the common law tended to the formation of fairly uniform ideas of constitutional law. The Federal Constitution provided what the Articles of Confederation had almost completely lacked. The courts authorized by the Constitution acquired jurisdiction not only of constitutional questions, disputes between States and admiralty matters, but also, within certain limitations, of cases wherein citizens of different States were parties. Both the Articles of Confederation and the Constitution provided that full faith and credit should be given to the proceedings of a State court by the courts of every other State and an essentially national character was impressed upon American jurisprudence. Thus, while the Federal courts had exclusive jurisdiction in certain cases (a power which the decisions of Chief Justice Marshall greatly increased), the division was not as between matters of purely public and those of private law. All the courts, State and national, became necessary and component parts of one symmetrical system, in which there was one approximately uniform mode of procedure, that of the common law of England, consciously adapted to American needs. Judges appointed by popularly elected governors or elected directly by the people, decided questions of law and equity presented by lawyers who had little of the class traditions of the English barrister. The American lawyer was from the first amenable to democratic influences. The requisites for admission to the bar were determined by State laws and not by slavish adherence to the traditions of the Inns of Court. The lawyer knowing no distinction between barrister and attorney, as obtained in England, gave advice to clients and tried their cases himself; he was not a member of a caste but of a more or less democratic society. The position which he assumed was one in which activity in politics was expected as well as accessibility to clients in matters more particularly concerning his profession. The influence of the American bench and bar has generally been to assist in making law to conform to social needs, or, in other words, in the democratization of law.

When the American colonies became independent, each was governed by (1) the common law of England, in so far as each had tacitly or expressly adopted it as suited to local needs; (2) those English statutes which were amendatory of the first; (3) the colonial statutes and (4) such customs as were peculiar to American conditions and incorporated in judicial decisions. In order to give authority to these earlier laws, nearly all of the original 13 States formally adopted them either by a constitutional provision, as in Delaware (1776) and New York (1777), or by legislative enactment as in Pennsylvania (1777). The method of adopting English statutes was by no means uniform. Vermont recognized the statute laws of England as existing prior to 1760, in so far as they were not repugnant to the constitution and laws

of the State. The beginning of the American Revolution (19 April 1775) was the date set in New York, and English statutes locally applicable and enacted prior to that time were declared in force. In Pennsylvania only those English statutes which were admittedly valid during the colonial period were continued. The Virginia convention of 1776 adopted the common law and English statutes of a general nature which had been enacted prior to 1607. This action was taken as a precedent in the first extension of law over territory belonging to the Federal government. The United States adopted the language of Virginia and extended the common law under the same limitations to the Northwest Territory. The Ordinance of 1787 was the foundation of the jurisprudence of the states carved out of Federal territory. In Michigan, while the English statutes were afterward expressly repealed, the substance of them was re-enacted and to prevent any confusion as to what system of law existed, the old *Coutume de Paris,* once in force when Michigan was a French possession, was declared abrogated. In Louisiana a different policy was followed. The Territory of Orleans, afterward the State of Louisiana, formed the most populous portion of the Louisiana Purchase. French in spirit and tradition, its institutions had been developed according to French ideas modified somewhat by Spanish influence. The civil law of France and Spain was continued in force. Thanks largely to the influence of the code prepared by Edward Livingston, who had in turn been influenced by Bentham, Louisiana is the only State of the Union whose jurisprudence is not based upon the common law. In the other States of the old Louisiana Purchase, the common law was adopted, as was proper according to the theory of the extension of law over territories hitherto uninhabited. In all the Western States, formed out of territory originally Mexican, the practice was the same and in all of them the common law is presumed to exist. While common-law powers were given to the courts in their entirety, in no State was there created an equity court having the full and complete jurisdiction which such a court had in England. Chancery courts, when created by legislative enactment, have had their powers conditioned and circumscribed by the law creating them.

The Period of Modern Law and Procedure (1850 to the Present).— The theory of American government is that the state and the people are one. In nothing has this theory produced more definite results than in law. This is true not only in positive legislative enactments made by the people's representative but in the indirect legislation of the bench, formulated by judges, the servants of the people. While it is the theoretical function of a judge to declare and not to make law, he may be a potent factor in bending old law to new needs. The irresistible tendency toward universal suffrage and the enormous increase in population which characterized the middle of the 19th century, at once left marks upon law and procedure. The States of the Middle West, which drew a large share of their inhabitants from Europe, entered upon an era of constitution-making. In these new expressions of fundamental rights, the Middle States put aside traditions, according to which their first constitutions had been framed, and built upon a democratic basis. The statutes, which up to that time were of comparatively small bulk, were revised and put into codes. Some States (for example, Ohio, Indiana and Iowa) abolished all common-law offenses and rebuilt their systems of criminal law upon a statutory basis. Impatience was felt at the technical methods which the courts had used and the adoption of the Reformed Procedure was the expression of this dislike.

In 1848 David Dudley Field, an eminent lawyer of New York, succeeded in having the legislature of that State adopt a code of civil procedure which effectually broke away from all tradition and aimed at the simplifying of civil pleading and practice by the abolition of all distinctions between actions at law and in equity. According to the reformed theory, there is but one form of action, based upon a complaint containing a simple statement of the facts constituting the grievance for which redress is asked in a judgment settling the rights, whether legal or equitable, of all the parties to the action. This theory was well calculated to appeal to the imagination of democratic commonwealths; one after another State adopted the New York plan as a whole or in part, and the Reformed Procedure is now in force in all but a few of the States. This system was, so far as pleading was concerned, an entirely new idea; it was neither a modification of the common-law method nor an adaptation of the various forms of equity pleadings. The Code furnished its own rules for the construction of pleadings upon its own peculiar principles. Whether or not the Reformed Procedure as in force in many States has resulted in simplicity is a question for legitimate difference of opinion. In some jurisdictions the constant tinkering with the laws of practice and procedure by the legislature has rendered that branch of the law so uncertain that probably more than one-half of the questions of law presented to courts of appeal are upon questions of trial or appellate procedure.

The second half of the 19th century was marked by stupendous development in industrial enterprise. Steam and electricity revolutionized the forces of production and distribution, and necessitated the employment of vast combinations of capital. Substantive law, as expressed in statute and decision, has followed sometimes closely, sometimes lagging behind, this industrial and commercial evolution. Contracts, once a small part of the body of law, now occupy a position once undreamt of. Insistence upon the form of a contract has given way to reasonable interpretation of its matter, viewed according to the changing conditions of commerce and trade. Corporations, once created only by the express favor of a sovereign, were given a new character such as modern society and its industrial enterprises demanded. But 200 private corporations were organized in the United States prior to 1800, and of these a dozen only were designed to engage in manufacturing. Limitations upon the States, declared by the decision in the Dartmouth College Case (1819), were to a large extent overcome by subsequent State constitutional amendments. Capitalistic production with its consequences created anew the purpose and idea of a private corporation. Individuals, none of whom had at command sufficient capital to float a large enter-

prise, joined their funds and in their associated capacity received as a matter of right a charter from the State. The charter, the powers of which were limited by the law of its authorization, at first special and afterward general, gave the corporation a personality having certain rights. As a consideration for these rights, the corporation assumed certain statutory burdens and regulations. Unless by the express or implied authority of its charter, a corporation cannot engage in business outside of the jurisdiction creating it. In other States it is a foreign corporation. As such, the other States may stipulate the conditions under which it may enter to do business. Here the Federal Constitution steps in. Under it Congress has the power to prescribe rules for the regulation of interstate commerce. The organization of railway systems extending through several States and the increase in production of large manufacturing corporations, selling their output in many States, have given opportunities for national legislation. The diverse citizenship of corporations and the large interests represented by them, as well as the limitations placed upon the States by the 14th Amendment, have brought a constantly increasing number of cases into the Federal courts. Thus the American law of corporations, a compound of national and State legislation and of Federal and local decisions, is of increasing bulk and variety, and no subject of the law has grown into greater importance.

The doctrine of judicial review, first authoritatively set forth by Chief Justice Marshall in Marbury v. Madison (1803), was expounded and amplified by Thomas M. Cooley in his 'Constitutional Limitation' (1868). This work had an almost unrivaled influence upon bench and bar. The courts, at least until the close of the 19th century, were generally under the domination of the doctrines of natural rights and *laissez-faire*. With the increasing sphere of legislative activity in Congress and in the State legislatures, based upon newer conceptions of social justice, there frequently appeared decisions by the courts, Federal and State, which many regarded as reactionary, and even as usurpations of power. Justice Holmes in several dissenting opinions of the United States Supreme Court has strikingly emphasized the true function of the judiciary. It would seem that in recent years courts have been more conservative than formerly in declaring statutes unconstitutional.

Increasing attention has been paid during the present century to improvement in the form of the statute law. Many States, realizing that legislative activity is still on the increase, have sought to remedy the traditional crudities of expression and to improve the technical quality of the statutory law by the establishment of legislative reference and law-drafting bureaus. It is too early, however, properly to appraise the influence of these agencies.

Earlier diversities of law among the various States produced great confusion, particularly in the field of commercial law. As a result of the efforts of the Commission on Uniformity of Legislation, an instrumentality working with and encouraged by the American Bar Association (established in 1878), a uniform Negotiable Instruments Act has been adopted by all the States and Territories except Georgia and Texas. Uniform warehouse receipts, stock-transfer, bills of lading, sales and partnership acts, prepared and advocated by this commission, have been adopted by many States. This body of uniform State laws is increasing yearly and its influence may well be to develop a new common law, wherein identical statutes will give rise to uniform interpretation.

The noteworthy tendencies in American law at the present time are, (1) the constantly widening sphere of government, State and Federal, away from *laissez-faire* and toward collectivism and State interference, motivated by a new sense of social justice and not by individualistic natural rights, and effected by the statutory enlargement of the police power by the States, and by what is in effect a Federal police power exercised under the guise of power over interstate commerce; (2) the increasing adoption of uniform legislation in matters affecting business; (3) the progressively increasing area of statutory law, Federal and State, by legislative assemblies and by popular initiative and referendum; (4) the confusion between purely constitutional and properly statutory matters; (5) the modified conception of the judicial function, and (6) simplification and settlement of judicial procedure.

For nearly two centuries and a half after the English colonies were planted in America, American jurisprudence changed gradually, keeping in harmony with the political and social conditions of the colonies and States. Then with a great wave of immigration and far-reaching industrial changes and the occupation of a continent from ocean to ocean, American jurisprudence set itself to meet the needs of a modern and complex society. The result has been an enormous product of legislation and a much bulkier output of decisions from the Federal and State courts. A system of law, to be sound, must have an orderly development; it must be progressive and not revolutionary. Many of the changes which have taken place in America have likewise been adopted in England and for the same reason as in this country. Since 1875 the English procedure has been similar to the American. Both the English and American systems of jurisprudence are, therefore, parts of one great system, based upon the common law of England and built to satisfy the requirements of a modern commercial and industrial society, wherein personal freedom has the greatest possible play. Its idea of personal right is its heritage from the common law. See also various articles under LAW.

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52. RAILROAD TRANSPORTATION. The American Railway System.— The construction of railroads in the United States began on a small scale in 1828 when the Baltimore and Ohio built its first mileage. The Charleston and Hamburg began constructing some mileage in South Carolina in the following year, and in 1830 the Mohawk and Hudson, the parent company of the New York Central system, began construction. The work undertaken by these pioneer railroads proceeded so slowly at first that in 1830 but 23 miles of line were in actual use. During the following decade other lines, radiating from the various North Atlantic seaports, were begun, so that by 1840, 2,818 miles of line had been completed. Railroad promoters still had difficulty in obtaining the necessary construction funds. They had to depend largely upon local communities and business men who desired improved transportation rather than upon investors and financiers. The practical feasibility of railroad transportation had not been demonstrated to the satisfaction of the investing public. During the decade 1840 to 1850 the construction of railway mileage progressed slowly to 9,021 miles, and was confined largely to the Atlantic seaboard section. It was not until the last two years of the decade that railroad construction began to progress rapidly. The gold discoveries in California caused an unusual demand for overland routes to the West; they directed the attention of the seaboard population to the resources of the interior; and they were instrumental in solving the money stringency which had hampered construction. The construction engineers' field of action was shifted mainly to the Central West. Private speculation was rampant; many States, cities, counties and townships offered aid to railroad companies more freely than in early years; even Federal aid, offered indirectly through the States, became a substantial factor in railroad building. Business prosperity prevailed throughout the country, carrying with it a demand for improved transportation facilities. By 1860 a combined system of 30,626 miles had been completed.

The Civil War interrupted line construction in the country as a whole, but gave a special stimulus to the building of a transcontinental line to the Pacific Coast. The beginning of the Union-Central-Pacific line during the war was due in large part to the urgent desire on the part of many public men to bind the far western territory to the Central West and East. They were actuated by rumors to the effect that the Pacific Coast section was threatened with annexation to Canada. Before this line was completed other transcontinental lines were under way. During the years 1867 to 1873 railroad construction forces were unusually active throughout the Trans-Mississippi Valley and the far West. The railroad mileage of the United States as a whole was increased by 33,000 miles. An interruption then accompanied the financial and industrial crisis of 1873, the crisis having in fact been brought on largely by excessive railroad capitalization and too rapid construction of new mileage. In 1880 railroad construction again began to progress rapidly. The railroad system advanced from 93,267 miles in 1880 to 163,597 in 1890, over 70,000 miles being completed in a single decade. During the following decade 29,749 miles were added. The long extended business and financial depression beginning in 1893 and the over-construction of the preceding decade brought the work of many construction gangs and promoters to a halt. More progress was made during the decade ending in 1910 when 46,947 miles were completed, but since then railroad construction funds have been directed more largely to the improvement and building of terminals, sidings, additional tracks and operating facilities than to the building of more mileage. Single-track mileage advanced from 240,293 miles in 1910 to 252,231 in 1914; the coming of war conditions then became a factor. On 31 Dec. 1917, the last date for which complete mileage figures are published, the country's single-track mileage aggregated 253,626 miles, exclusive of switching and terminal companies. On 31 Dec. 1916 railroad trackage in the United States, included second, third and other tracks as well as single-track mileage totaled 397,014 miles. In 1913 the whole of Europe had approximately 215,000 single-track miles of line, and the entire world, exclusive of the United States, had about 430,000.

Equipment and Personnel.— At the closing of the calendar year 1917 it was officially reported that the railroad companies operating this mileage were equipped with 2,568,374 cars, of which 2,409,548 were in the freight service, 55,939 in the passenger service and 103,916 in company service. In addition the Pullman Company owns over 5,000 sleeping, tourist, parlor and other specialized passenger service cars, and on 1 Jan. 1913 137,179 privately owned freight cars were in use throughout the United States. The number of locomotives in service on 31 Dec. 1917 totaled 66,070. There has been a steady tendency to increase the capacity of freight cars and locomotives in the United States. The average capacity of freight cars in the United States now exceeds 41.3 tons as compared with 14.5 tons in Germany where the average capacity is the largest in Europe. Many American cars in the coal and ore trade have a capacity ranging from 50 to 65 tons and some exceed this figure. The average weight of German locomotives before the war was 52 tons, excluding tender, while the average weight of locomotives, including tender, in the United States is close to 90 tons. During the 10 years ending in 1916 the average number of tons per train in the United States has advanced from 344 to 535; the average number of tons per loaded car from 18.9 to 22.4; the average number of freight cars per train from 26½ to 34.9 and of loaded freight cars per train from 18.2 to 23.4. The railroad companies in operating the railroad system during the calendar year 1916 employed an average of 1,700,814 employees and paid $1,506,961,000 in wages and salaries. In 1917 Class I lines, i.e., those having a yearly operating revenue exceeding $1,000,000, employed an average of 1,732,876 employees who received a total compensation of $1,739,482,000.

Railroad Capitalization.—The magnitude of the American railroad system is further portrayed by its huge capitalization. The total par value of railroad capital outstanding in 1917 was $20,247,659,000. The proportion of this representing watered securities cannot be accurately stated, as current statistics of market value are not published and the work of valuation undertaken by the Interstate Commerce Commission is far from completion. On 1917 investment in road and equipment, representing the book values reported by the Class I and II railroads, amounted to $18,423,235,000. An accurate comparison cannot, however, be made because of inaccuracies occurring in book values before the commission prescribed a uniform accounting schedule for investment in road and equipment. The dividends declared by the railroad companies, excluding switching and terminal companies, in 1917 totaled $381,852,000 or 6.81 per cent on the dividend-yielding stock. Over 36 per cent of the capital stock of American railroads, however, was not paying any dividends whatever. Railroad dividends reached their maximum in 1911 with $460,195,000 and an average rate on dividend-paying stock of 8.03 per cent.

Revenues and Expenses.— The operating revenues of the railways operated under government control in the calendar year 1918 reached the astounding total of $4,913,320,000. Of this, $3,450,094,000 consisted of freight revenues, $827,219,000 of passenger revenues and the remainder of mail, express, miscellaneous transportation, incidental and point facility revenues. Although these operating revenues were greater than during previous years, expenses underwent a more rapid increase and caused a heavy reduction in net operating income. Operating expenses of the lines under government control rose from $2,858,212,000 in 1917 to $4,006,-895,000 in 1918. After these expenses, and also tax accruals (other than war taxes), uncollectible revenues, equipment rents and joint-facility rents were deducted there was a balance or net operating income of but $690,419,000 in 1918 as compared with $974,779,000 in 1917. There was a deficit of about $210,000,000 below the standard return guaranteed by the government under the Federal Control Act. It is this reduction of net income that so greatly complicates the return of the railroads by the government to the railroad companies and the adoption of a satisfactory governmental policy. The average rates of operating expenses to operating revenues or "operating ratio," advanced from 70.5 per cent in 1917 to 81.5 per cent in 1918.

Railroad Traffic.— The freight traffic of the railroads operated under government control measured in ton-miles, advanced slightly from 427,342,924,000 in 1917 to 434,997,928,000 in 1918. A total of 1,264,016,000 tons of freight were carried in 1917, 57.96 per cent of which consisted of coal, ore, coke, sand, stone and other mine products, 15.27 per cent of manufactured products, 8.28 per cent of agricultural products, 7.98 per cent of forest products, 2.52 per cent livestock and animal products, and 7.99 per cent of miscellaneous commodities and general merchandise. The large proportion of heavy, bulky commodity traffic is one of the striking differences between the freight traffic of American and European railroads. So also is the long average haul per ton of freight which was 312.07 miles for Class I railroads in 1917 as compared with about 62 in Germany and 78 in France shortly before the European War began. The passenger traffic of American railroads has, with the exception of a few unusual lines, always been of secondary importance as a source of operating revenue. It has, however, grown largely in volume during the past 15 years. Many railroads improved their passenger services and actively competed for passenger traffic. Measured in passenger miles it advanced from 29,082,837,000 in the fiscal year 1908 to 42,605,902,000 in the calendar year 1918, excluding short lines having less than $100,000 in yearly revenues and switching and terminal companies.

Railroad Freight Rates.—In making freight rates in the United States the railroads have not been guided by rigid rules or theories. The most general practice has been to make rates at "what the traffic will bear," i.e., at a point believed by them to yield the largest revenues in the long run rather than at the present moment and to encourage the development of traffic in the future. This practice has, however, been subject to a minimum determined in the case of the general level of their rates as a whole by the aggregate cost of service, and in the case of an individual rate, by the special or out-of-pocket costs incurred in connection with a particular item of traffic. It is also subject to a maximum determined by the value of the service performed. As the extent of public regulation of rates increased, many rates made originally by the railroads were changed by the Interstate Commerce Commission or by State commissions, the judgment of whom regarding the reasonableness of rates sometimes differed from that of the carriers. During Federal control rate changes were initiated by the Director-General of Railroads, the Control Act of March 1918 requiring the Interstate Commerce Commission when reviewing them to give due consideration to revenue needs and expenses as certified by the President.

Freight rates may be variously grouped according to their form or application. They may be either class or commodity rates. In the former case thousands of items of freight traffic have been grouped into a limited number of classes, all those in the same class receiving the same rates. Three major freight classifications: — the official or eastern, the southern and the western — govern most classified freight in the United States. In addition there is a Canadian and a Mexican classification, applicable to some American shipments; a number of State classifications established by State laws or commissions, and certain exceptions to the major classifications due to the refusal of some lines to accept them in full. Various efforts have been made by the railroads to unify freight classification throughout the United States, but only a limited degree of success was attained. In 1918 when the lines were under government control a tentative consolidated classification was prepared under the direction of the Director-General, its adoption depending upon the completion of an investigation undertaken by the Interstate Commerce Commission. In September 1919 the commission recommended the adoption with modifications of certain parts of the proposed consolidated classification. Much freight is not shipped

under class rates, but under commodity rates which are quoted for specified articles without reference to classification. Commodity rates usually are lower than class rates; they are granted to most freight moving in large volume and particularly to heavy, bulky commodities requiring low rates in order that the traffic will readily move. A distinction is also drawn between local and through or joint rates; the former applying between points located on the same line and the latter between points located on different lines. Joint rates involve agreement among the different carriers transporting a through shipment and make necessary the arrangement of rate divisions among them. By no means all through traffic is covered by joint rates. Much traffic moves between points located on different lines on a combination of local rates, and so-called proportional rates have also been established at various points. Under this latter plan instead of applying a joint rate or a combination of locals, a proportional rate to some defined gateway or rate point is added to the rates lawfully in effect beyond, the proportional rate being lower than the local rates to the gateway, but applicable only in case of through shipments.

Many complicated rate structures have developed in the different traffic sections of the United States. Differences in the amount of water, rail and industrial or commercial competition is largely responsible for the existence of sharply defined freight rate structures. Local rates covering short distances are frequently based upon mileage, but as the length of the haul increases distance tends to play a less important rôle in rate making. There are also many so-colled mileage scales applicable to long distance traffic, but they do not grade rates strictly on a mileage basis. The aggregate charges on a shipment moving under a mileage scale gradually advance as distance increases, but not in the same proportion; the rate per ton per mile declines as the length of the haul increases, and beyond certain distances the scales usually provide flat rates for all distances. Distance also is an important factor in the percentage rate system applicable between points in the Central West and the Atlantic Seaboard. The rates between Chicago and New York are basic in this rate structure; those between New York and other Central Western points are determined largely although not entirely according to their relative distance from New York as compared with the distance from Chicago to New York; and those between Central Western points and North Atlantic ports, other than New York, are determined from the New York rates by applying fixed "port differentials." Throughout Southern territory distance considerations are less important. Because of water and commercial competition there are belts of blanket or uniform rates along the South Atlantic Seaboard, in Virginia, and along the Ohio River; and there are many basing points throughout the South where the long and short haul principle is not applied. Distance is also disregarded in a large measure in the interstate rate structures of Texas and the Southwest, of the Central Trans-Mississippi Valley and the Northwest, and of the transcontinental railroads which carry freight to and from the Pacific Coast terminals.

Although there has been a tendency to establish graded distance rate scales a large number of group rates applying uniformly throughout defined areas remain in effect in many parts of the United States. Even in the North Atlantic States where distance largely controls the rates from the Central West to the large seaports, group rates apply to large areas inland from Boston, New York, Philadelphia and Baltimore.

Freight and Passenger Services.— Freight trains are of two general kinds — tonnage trains which move forward when the desired number of cars are loaded or when the officials in charge of operation consider it expedient, and scheduled freight trains which are dispatched at regular times. The latter usually carry perishable products, high-class freight and commodities in the delivery of which speed is important. On some lines extensive arrangements have been made for expediting "time," "fast" or "preference" freight by means of special billing, car placards, telegraphic reports and special operating regulations. In certain industries, particularly in the fresh fruit and vegetable, meat products, oil, coal and livestock industries, much freight moves in privately owned freight cars. Some of these cars are owned directly by shippers, and others by private car line companies, most of which, except in the case of palace livestock cars, are subsidiaries of shippers. The freight rates paid by shippers using their own cars are the same as those paid by other shippers, but the private car owners receive a mileage allowance from the railroads as a rental for the use of their cars. In case of private refrigerator cars the icing charge collected from the shipping public by the railroads, moreover, reverts to the private car line if it performs the icing service. Many special freight services are performed and privileges granted by the railroads. They are in some instances covered by the regular line haul freight rate, while in others the shipper or consignee is required to pay special charges. Important examples are the reconsignment privilege, stopping in transit, switching and spotting cars, the peddler car service, the milling in transit privilege in the flour and lumber industries, the fabrication in transit privilege in the iron and steel industry, the recompressing privilege in the cotton industry and the in-transit privilege which has been extended to various western wool centres. Somewhat different are the demurrage and storage charges of the railroads, for they are primarily penalties designed to release equipment and station or warehouse space. Carload shippers and companies are required to load and unload freight cars within a specified free time or pay a demurrage charge per car per day after its expiration. Consignees of less than carload shipments are similarly required to remove their freight from the freight station or other delivery point within a specified free time or on their failure to do so to pay railroad storage charges; and, in case the freight is sent to a public warehouse by the carrier, also whatever cartage and public warehouse charges are incurred.

Passenger services in the United States are not classified as systematically as in Europe, but a number of rather well-defined classes have developed. The Pullman and parlor-car service corresponds roughly to the first-class service of European railways, and the regular

first class, day-coach service corresponds roughly to the second-class service provided in Europe. American railroads do not regularly provide services similar to the third-class service generally found in Europe and the fourth-class service provided in some countries. In some parts of the United States, however, the railroads perform a second-class service which varies widely in definition and quality. In some instances it bars the passenger from the Pullman and parlor-cars, but permits him to occupy the regular day coaches; in some it enables him to occupy a tourist sleeper; in others it limits him to a smoking-car, a special second-class day coach, or to the regular day coaches of designated trains. *Bona fide* immigrants arriving at certain ports have for some years been provided with a special immigrant service at very low fares and mention should also be made of the colonist, harvester and special excursion services which were offered from time to time in the past, but were largely restricted during the war.

Business Organization of American Railroads.— The business organization of American railroads varies according to the volume of their traffic, the importance of particular kinds of traffic, the extent of their mileage and the area within which they operate and the views of higher officials with respect to efficient organizations. The president reporting to the board of directors is the chief executive official in most instances, but on some lines the chairman of the board virtually performs the functions of an executive. Under the president there usually is a varying number of vice-presidents, who act as the chief executive officials of particular departments or in the capacity of general vice-presidents. There is also a Secretary's Department under a secretary, who reports directly to the president and board of directors. The president, vice-presidents and secretary and some of the other department heads frequently including the general counsel, treasurer and comptroller, comprise the Executive Department. The exact make-up of this department, however, varies in different railroad companies. The specific business departments of most large American railroads include the following: (1) Secretary's Department; (2) Law Department; (3) Treasurer's or Financial Department; (4) Comptroller's or Accounting Department, which is subdivided into the comptroller's office and four or five auditing departments; (5) Transportation Department, which is subdivided into three subdepartments — operating, maintenance and mechanical or motive power; (6) Traffic Department, which is divided into a freight and a passenger traffic department; (7) Insurance Department; (8) Purchasing Department, which in some railroad organizations is combined with a Supply Department; (9) Real Estate Department; (10) Relief and Pension Departments, which may be separate or combined, and (11) Freight Claim Department. A number of lines also have so-called Industrial Departments, separate from the Traffic Department, to promote the location of industrial plants on their lines. There are many associations and joint organizations which constitute important parts of the business organizations of the railroads. Among them are their freight and passenger traffic associations, in which competitive rates and fares are discussed before changes are initiated. The three main freight classifications are issued by the Official, Southern and Western classification committees jointly maintained by the railroads for this purpose. Many rate tariffs are issued for groups of railroads by joint agents. Freight claims on through shipments are adjusted in accordance with rules laid down by the Freight Claim Association, and claim disputes are arbitrated by arbitration committees provided by this association. In case of labor disputes the practice of the companies, in recent years, has been to act jointly through committees. There are also many technical associations, the largest of which is the American Railway Association. The smaller technical associations are brought together in this parent organization, through which many improvements have been effected, and various functions such as the per diem and car service rules of the carriers are administered. Some of the smaller associations, such as the Master Car Builders' Association and the Master Mechanics' Association are also of great importance in railroad administration and operation. Practically every department and many subdepartments of the railroads throughout the United States as a whole or in smaller sections are affiliated through their particular technical associations.

The Federal Railway Administration.— In a proclamation issued 26 Dec. 1917 the President of the United States took over for Federal control all the large railroads, and many of the smaller lines, and appointed a Director General to administer them. The President acted under powers granted to him by Congress on 29 Aug. 1916. Later in March 1918 Congress enacted the Federal Control Act to authorize a Federal guarantee of carriers' revenues equal to their average annual operating income for the three years ending 30 June 1917; to arrange for contracts with the various lines; to limit dividends; provide a revolving fund of $500,000,000; regulate railroad securities, and define the rate powers of the President and the Interstate Commerce Commission. The organization of the Federal Railroad Administration under the Director General consists: (1) Of a central administration to control and supervise the various branches of railroad operation; (2) a regional administration to administer the lines within seven defined regions and (3) a number of advisory committees and commissions. The Central administration includes the main office of the Director General and Assistant Director-General, a Division of Finance and Purchases, Division of Capital Expenditures, Division of Operations, Division of Traffic, Division of Public Service and Accounting, Division of Labor, Division of Law and Division of Inland Waterways. The Regional administration in each of seven operating regions is not made up uniformly but in most cases includes a regional director, and a general staff consisting of an assistant regional director, assistants in charge of operation, traffic, mechanical work and engineering and committees to administer traffic, purchasing and other matters. Some of the regions are, moreover, divided into districts in charge of district directors. Each railroad system is under the immediate control of a Federal manager, and

in most regions one or more terminal managers have been appointed. The advisory committees and commissions include a Port and Harbor Facilities Commission, a Board of Railway Wages and Working Conditions, a committee on Inland Waterways, and an Exports Control Committee.

Government Regulation of Railroads.— Regulations of railroads in interstate commerce began with the enactment of the Interstate Commerce Act in 1887. Its application was widely different from what its framers anticipated, in part because of the defects of the statute itself and partly because of the way some of its provisions were interpreted by the courts. Congress, in later years, enacted a series of important amendments. To overcome the refusal of railroad officials to testify before the commission on the ground that they might incriminate themselves, Congress in 1893 enacted the "immunity bath" amendment, which requires them to testify, but protects them against prosecution on account of testimony or evidence submitted by them, and this amendment was upheld by the Supreme Court in 1896. To strengthen the anti-rebating clause of the law, Congress in 1903 enacted the Elkins Act. Corporations as well as their agents were made liable; departure from published rates was made the test of rebating, and the receivers of rebates were declared to be as much guilty as the railroads paying them. This law abolished the penalty of imprisonment, leaving a fine as the punishment for guilt; but imprisonment as well as fines were re-enacted when the Interstate Commerce Act was again amended in 1906. In 1903 Congress also passed the "expediting act," the purpose of which is to expedite cases appealed to the Federal courts from the Interstate Commission, and equity cases of any kind brought under the Interstate Commerce Act, the Sherman Anti-Trust Act, or other laws of like purpose. A more comprehensive amendment was enacted in 1906. The Hepburn amendment of that year widened the scope of the Interstate Commerce Act to include not only railroads, but express companies, pipe lines, sleeping car companies, industrial railroads, switches, private tracks and terminal facilities, private cars and refrigerator ventilation, elevation, transit, storage and handling service in interstate commerce. Rate changes were prohibited without a 30 days' notice, unless the Commission waived this requirement for good cause; rebating penalties were increased in severity, and free passes were prohibited except in case of employees and other persons expressly specified in the law.

A "commodities clause" prohibited railroads from transporting in interstate commerce any products produced by themselves, except timber and lumber products and commodities intended for use by the railroads in their business as common carriers. The so-called Carmack Amendment required carriers receiving traffic for interstate shipment to issue bills of lading and held such railroads liable for loss or damage to property caused by any carrier over whose lines the traffic passes in moving to its destination. The Commission was given the power to fix a reasonable maximum rate for one found, after full hearing upon complaint, to be unreasonable or unjustly discriminatory, and this rate-making power includes interstate freight charges of any kind, passenger fares, rate divisions and through or joint rates. The orders of the Commission were declared to be binding unless specifically set aside or superseded by a Federal court of competent jurisdiction. To give effect to the Commission's power to prescribe a uniform system of accounts it was now provided that carriers may keep no other set of books than those prescribed by the Commission, and that it may employ special agents and examiners to inspect all their accounts and records. To further expedite the work of the Commission it was given additional power to call upon the carriers, not only for the usual annual statistical reports, but for monthly reports of earnings and expenses and special reports on any matter within its jurisdiction.

The Interstate Commerce Act was again amended in 1910 when the Mann-Elkins amendment was passed. The Commission was authorized to suspend proposed rate advances before they go into effect. The original suspension holds, during the time authorized by law for hearings and investigation of the proposed rates, after which the Commission may permit them to become effective or suspend them permanently. A special Commerce Court was created to handle review cases appealed from the Commission, and various other classes of railroad cases. This court, however, was abolished in 1913. The long-and-short haul clause, which had been rendered ineffective by court interpretation of the words "under substantially similar circumstances and conditions," was amended by striking this limiting phrase out of the clause. There may be no violation of the long-and-short-haul principle unless the Commission, in particular instances, expressly waives its application. The Commission was also authorized to fix maximum rates on its own initiative, and to regulate freight classifications. Shippers were authorized to select the through routes over which their shipments are to move; and the railroads were required to quote rates upon written request to their agents. They were directed to bring suit against the United States, and the Department of Justice was placed in charge of all litigation involving appeals from the Commission's orders. Each carrier, moreover, was required to designate an agent at Washington, D. C., upon whom orders and notices may be served. A Securities Commission was created to report on and make recommendations to Congress concerning railroad stocks and bonds. Telegraph and telephone companies engaged in interstate commerce were brought within scope of the Act.

A further amendment to the Interstate Commerce Act is contained in the Panama Canal Act of 1912. The Commission was given power to establish physical connections between rail and water carriers; to fix maximum proportional rail rates to and from ports; to establish through routes and maximum joint rates over rail and water lines; and, if it finds a railroad entering into arrangements with an ocean carrier at any port, to require it to enter into similar arrange-

ments with all other ocean carriers operating from such port to the same foreign country.

The Panama Canal Act also prohibits railroad-controlled steamship lines which are or may be in competition with the proprietory railroad from navigating the Panama Canal. Railroad ownership or control of steamship lines, operating elsewhere than through the Canal, which are or may be in competition with the controlling railroads, is prohibited unless the Interstate Commerce Commission permits such railroad control to continue. The Commission may grant such permission only if it is of the opinion that the controlled steamship line is operated in the interest of the public, and that the continued ownership will not prevent or reduce competition.

In 1913 the Interstate Commerce Act was enhanced by the passage on 1 March of the Railroad Valuation Act. In 1915 the Cummins' amendment providing for full settlement of loss and damage claims was enacted, only to be radically reamended the following year. In 1917 a "car service amendment" increased the Commission's powers over car distribution and car service rules; a "priority amendment" authorized the President, during the war, to grant priority to designated traffic, a power which he exercised through a Priority Director; a "commission organization amendment" increased the membership of the Interstate Commerce Commission to nine, authorized the establishment of responsible divisions, and provided that "no increased rate or charge or classification shall be filed except after approval thereof has been secured from the Commission." The Federal Control Act of 21 March 1918 amended the Interstate Commerce Act by authorizing the President to initiate charges by filing them with the Commission; by preventing the Commission from suspending such charges pending final determination, and by requiring the Commission when investigating such rates upon complaint to give due consideration to the absence of competition under Federal control and to certification from the President to the effect that it is necessary to increase operating revenues to defray the expenses of Federal control, to pay railroad taxes, and to pay the compensation guaranteed to the railroad by the government.

Federal legislation, other than the Interstate Commerce Act, affecting the railroad industry includes the Sherman Anti-Trust Act of 1890, and the amended Clayton Anti-Trust Law of 1914; the Erdman Conciliation and Arbitration Act of 1898 as amended by the Newland's Act of 1913; the safety appliance laws of 1893; the locomotive ash-pan act of 1908; the sixteen-hour continuous labor act of 1907; the eight-hour wage basis law of 1916, and the bill of lading act of 1916.

State Regulation of Railroads.— Regulation of the railroads by the States antedates Federal regulation by many decades. All of the States, except Delaware and Utah, now have commissions with rate-making powers. There are three general types of State commissions: (1) Public utility commissions with jurisdiction, not only over railroads and other rail transportation facilities and agencies, but also over other public utilities, such as street railways, gas, electric, water, warehouse, telegraph and telephone companies; (2) railroad commissions with jurisdiction over railroads and a more limited number of other transportation and public utility concerns; and (3) corporation commissions with authority over public utility companies and also other corporations.*

The powers of these commissions vary. Many of them have powers similar to those of the Interstate Commerce Commission, while some of them are vested with greater powers as well as wider jurisdiction. Many possess powers with respect to railroad capitalization, some are authorized to prescribe complete schedules of maximum rates, and some have widely differing powers over railroad services and operation. Besides the commissions upon whom the States have conferred mandatory powers the legislatures of many States also regulate railroad charges and practices directly by statute. There are two-cent fare and maximum freight rate laws, and statutes regulating car service and demurrage, private sidings, grade crossings, terminal facilities, train service, safety appliances, head lights, the size of train crews, capitalization and other phases of railroad operation too numerous to describe in limited space.

As the extent of State regulation increased a conflict developed between the States and the Interstate Commerce Commission. The United States Supreme Court in 1886 had drawn a line between Federal and State regulation when it decided that the Federal railroad laws applied only to interstate traffic. In later years it became apparent, however, that although the States were not regulating interstate traffic directly they were doing so indirectly. The making of an interstate rate may, because of business competition, virtually compel a railroad to readjust some of its interstate rates or otherwise permit an unjust discrimination against interstate shippers to stand. When, therefore, the Interstate Commerce Commission in its Shreveport Rate case fixed reasonable maximum rates from Shreveport, La., to points in Texas and ordered the railroads whose interstate rates in Texas were fixed at a lower level by the State of Texas to discontinue discriminating against interstate traffic, the railroads complied by raising their rates on intrastate traffic moving between various points in Texas. In the test litigation that followed the Supreme Court in 1914 held that the Interstate Commerce Commission had the power to overrule a State Commission which fixes intrastate rates resulting in unjust discrimination against interstate traffic carried at rates which the Federal commission pronounces to be reasonable. In a series of later decisions involving similar conflicts in Nebraska, South Dakota, Illinois and Arkansas

* The following States have public utility commissions: Alabama, California, Colorado, Connecticut, District of Columbia, Georgia, Hawaii, Idaho, Illinois, Indiana, Kansas, Maine, Maryland, Massachusetts, Missouri, Montana, Nevada, New Hampshire, New Jersey, New York, Ohio, Oregon, Pennsylvania, Rhode Island, Vermont, Washington, West Virginia, Wisconsin, Wyoming. The following have railroad commissions: Arkansas, Florida, Iowa, Kentucky, Louisiana, Michigan, Minnesota, Mississippi, Nebraska, North Dakota, South Carolina, South Dakota, Tennessee, Texas. The following have corporation commissions: Arizona, New Mexico, North Carolina, Oklahoma, Virginia.

the courts reiterated the superior power of the Interstate Commerce Commission in case of conflict between intra- and interstate rates, but insisted that the Commission's orders must be specific in defining the rate points or areas within which State-made rates are overruled.

Future of Control or Regulation.— Neither the Interstate Commerce Commission nor the States regulated the railroads with their usual energy while the lines were under control of the Federal Railway Administration. So long as the war continued no effort was made to thwart the wishes of the Director-General of Railroads. With the signing of the armistice, however, arose the desire for a permanent transportation policy. Many plans were proposed ranging from government ownership to a return of the railroads to their owners, subject to direct or indirect guarantees of income and Federal regulation differing in many respects from that which prevailed in the past.

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53. FOREIGN COMMERCE. The foreign commerce of the United States has expanded with even greater rapidity than that of the other parts of the world. World commerce increased from $1,000,000,000 in 1789, the year of our birth as a nation, to $40,000,000,000 in 1913, the year preceding the great war which disarranged all commercial movements, while the foreign commerce of the United States grew from $43,000,000 to $4,300,000,000 in that same period. World commerce in 1913 was 40 times as great as in 1789, while United States commerce in 1913 was 100 times as great as in 1789.

Exact and continuous records of our foreign trade did not come into existence until the adoption of the Constitution. Indeed, one of the most important reasons for the formation of that "more perfect union" was in order that the government might have a greater control over the records of the commerce and the collection of the revenue arising therefrom. Prior to the Revolution, which transformed the 13 colonies into a Confederation, whatever record was made of their commerce was that of the individual colonies, kept in an irregular manner and sometimes drawn from that of the mother-country with which most of the commerce occurred. Under the Articles of Confederation the various States were permitted to fix their respective tariff duties subject to the provision that they should not "interfere with any stipulations in treaties entered into by the United States in Congress assembled with any king, prince or state in pursuance of any treaties already proposed by Congress to the courts of France or Spain." With the various States privileged to fix their own taxation both upon imports and otherwise, the Congress soon found that it was unable to obtain from them their proportionate part of the revenues required for the maintenance of the government, while foreign governments were disinclined to make treaties with the States or the Union under these circumstances. The request of Congress that it be permitted to levy and collect uniform rates of duty on imported merchandise was rejected by the State of New York, and this with sundry other reasons led to the substitution of the Constitution for the Articles of Confederation.

The first record of the commerce of the United States under the Constitution is that of the year 1790. Prior to that time there were occasional compilations of the records of the various States, but no continuous record of the imports or exports of the colonies or States. MacPherson's 'Annals of Commerce' puts the imports of the colonies in 1769 at $12,760,000 and the exports $13,870,000. Of the imports $7,867,000 were from Great Britain, $3,840,000 from the West Indies, $734,000 from Africa and $373,000 from southern Europe. Of the exports $7,445,000 went to Great Britain, $3,635,000 to the West Indies, $2,686,000 to southern Europe and $98,000 to Africa. During the Revolutionary War the commerce fell to a very small total, and during the period of the Confederation had slowly advanced to approximately $40,000,000, about evenly divided between imports and exports. In 1790, the first year under the Constitution for which a full record was made, the imports were $23,000,000, and the exports $20,000,000.

From the adoption of the Constitution forward the commerce steadily advanced. By 1800 the imports were $91,000,000, and the exports $71,000,000, though about one-half of the exports were foreign merchandise drawn chiefly from the West Indies and re-exported to Europe.

During the first half of the century, 1800–1900, the growth of the foreign commerce of the United States was comparatively slow. The people were busy developing the interior of the country and thinking out and applying to practical use the necessary methods for transporting the products or possible products of the interior to the water's edge, whence they could be transported to foreign countries. In 1819 occurred an incident which had a profound effect upon the commerce, not only of the United States, but also upon that of the whole world. In that year a little steamer, which had been built in New York at the suggestion of Daniel Dod, an engine builder of Virginia, sailed out of the port of Savannah, and pushed boldly out upon the ocean, heading for the ports of Europe, which had never, up to that time, been reached by a steam vessel from the western shores of the Atlantic. The voyage was successful, and the lessons taught by it resulted in the establishment in 1838 of regular steam navigation between the United States and Europe. Meantime the railway systems of the United States and of the world were slowly developing and by 1850 a railway line connecting the Atlantic with the Mississippi Valley was opened, the Boston and Albany road, and this was quickly followed by the New York and Erie, the New York Central, the Pennsylvania and the Baltimore and Ohio. During that same time the people of the United States were transferring a part of their population to the Mississippi Valley, and as a result of these occurrences, the development of transportation facilities and thus the cheapening of cost of transportation, the commerce of the country in the year 1850 was over $300,000,000, the imports being $174,000,000 and the exports $144,000,000.

In the second half of the century the foreign commerce grew by leaps and bounds. The

ocean steamer greatly developed its carrying power, tonnage multiplied and the cost of transportation on the ocean was greatly reduced, while the tremendous increase of the railway system of the country had a similar effect upon the cost of moving the products of the interior to the water's edge, and in this movement the Great Lakes also rendered marked assistance with the development of large and powerful freight carrying steamers which handled the merchandise which the railways were able to deliver to them at the western end of the chain and transfer from the eastern end to the tidewater. The development of the great manufacturing system of the country, the greatest in the world, added large quantities of manufactures to the available material for exportation and at the same time created a great demand for manufacturing material to be imported from other parts of the world. As a result the foreign commerce of the country which totaled but little more than $300,000,000 in 1850 was $686,000,000 in 1860, $827,000,000 in 1870, $1,504,000,000 in 1880, $1,647,000,000 in 1890, $2,244,000,000 in 1900, $3,302,000,000 in 1910 and $4,279,000,000 in 1913, all of the above figures being for fiscal years.

During all of this period of rapid growth the exports greatly exceeded imports, though prior to that development imports were usually as much as the exports, and frequently exceeded them. In the period from 1900 to 1913 exports were often as much as $500,000,000 in excess of the imports, and in fact the annual average of excess of exports during that period was about $500,000,000. This was due in the earlier part of that period to the fact that the United States had large quantities of meat and grain to spare for foreign countries, and in the later years to the rapid growth of the exportation of manufactures, which grew from $485,000,000 in 1900 to $1,185,000,000 in 1913.

With the opening of the great European War in 1914 there came a great change in the commerce of the United States, and while it was to some extent temporary it is significant as an illustration of the power of the great manufacturing industry of the country to respond to extraordinary demands from abroad, and suggestive as to the possibilities and probabilities of the future of our trade. The European countries at war required vast quantities of war materials, powder, shot and shell, firearms and materials for their construction, metal working machinery, barbed wire, high explosives of various kinds and miscellaneous manufactures for war uses, to say nothing of the demand for horses and mules for the war and materials for feeding and clothing their soldiers and the maintenance of their system of transportation. To all of these demands the producers of the United States, whether manufacturers or agriculturists and mine operators, responded with remarkable promptness and in volume of supplies, and the exports grew from $2,365,000,000 in 1914 to $2,769,000,000 in 1915, $4,333,000,000 in 1916 and $6,290,000,000 in 1917. With the entrance of the United States into the war there came great demands upon the manufacturers and producers for material for our own armies, and the government also found it necessary to restrict exports to prevent their passing to the Central Powers of Europe with which we were at war, and as a result the exports were temporarily reduced, despite the fact that those passing out of the country went at prices far above those prevailing prior to the war. The total dropped to $5,920,000,000 in 1918 but with the great food requirements of Europe and the demand for manufactures in the other grand divisions the fiscal year 1919 made the phenomenal record of $7,225,000,000 exports and $3,096,000,000 imports, making the grand total of imports and exports $10,321,000,000 against the former high record of $8,949,000,000 in 1917.

The developments of the last half century have resulted in a widening field for our commerce, both as to imports and exports. With the development of the manufacturing industry there came new demands upon the tropics for manufacturing material and a less demand upon Europe for manufactures, and the increasing population and the prosperity of the masses increased the demand for the products of other countries, such as sugar, tea, coffee, cacao, tropical fruits, silk for manufacturing, rubber, fibres, tin and other manufacturing materials. The wool production of the country was insufficient to meet home requirements and this was also true of hides and skins and other staple requirements of manufacture. As a result the value of manufacturing material imported in a raw state increased from $276,000,000 in 1900 to $1,110,000,000 in 1917 and $1,251,000,000 in 1919, and of manufactures for use in manufacturing from $92,000,000 in 1900 to $475,000,000 in 1917 and $606,000,000 in 1919. These two classes of manufacturing material which formed 46 per cent of the imports in 1900 were 60 per cent of the greatly increased total in 1919. Meantime manufactures showed an equal growth in the share of the rapidly increasing export trade, aggregating $485,000,000 in 1900, $1,185,000,000 in 1913, $4,136,000,000 in 1917 and $3,337,000,000 in 1919, under the stimulus of the demands of the war and the increased demand from neutral countries which found their supplies of manufactures from Europe greatly decreased. The manufactures exported in 1900 formed 35 per cent of the total exports of domestic merchandise, in 1913 42 per cent and in 1917 66 per cent.

The changed conditions of our trade and trade requirements above noted resulted in a readjustment of the share of the trade with the various sections of the world. In 1890 57 per cent of the imports were drawn from Europe, and 80 per cent of the exports went to that continent. In 1913 only 49 per cent of the greatly increased imports were drawn from Europe and 60 per cent of the exports sent thereto, though of course the great demands of the war have resulted in a temporary increase which merchandise for Europe forms of the exports. On the other hand Europe had little to sell and our imports from that continent fell off nearly 60 per cent during the war period.

The tables which follow show the growth of our commerce from 1789 down to 1919, presenting figures at decennial periods showing the total of imports and exports, and the share thereof with each grand division, also the share which foodstuffs, manufacturing material and manufactures respectively form of the imports and exports.

IMPORTS AND EXPORTS OF MERCHANDISE INTO AND FROM THE UNITED STATES, 1790 TO 1919.

(At decennial years prior to 1900; quinquennial years after 1900; annually during European War).

FISCAL YEARS	Imports	Exports (a)	Excess of imports	Excess of exports
1790	$23,000,000	$20,205,000	$2,795,000	.....
1800	91,253,000	70,972,000	20,281,000	.....
1810	85,400,000	66,758,000	18,642,000	.....
1820	74,450,000	69,692,000	4,758,000	.....
1830	62,721,000	71,671,000	.....	$8,950,000
1840	98,259,000	123,669,000	.....	25,410,000
1850	173,510,000	144,376,000	29,134,000	.....
1860	353,616,000	333,576,000	20,040,000	.....
1870	435,958,000	392,771,000	43,187,000	.....
1880	667,955,000	835,638,000	.....	167,683,000
1890	789,310,000	857,829,000	.....	68,519,000
1900	849,941,000	1,394,484,000	.....	544,543,000
1905	1,117,513,000	1,518,562,000	.....	401,049,000
1910	1,556,947,000	1,744,985,000	.....	188,037,000
1913	1,813,008,000	2,465,884,000	.....	652,876,000
1914	1,893,926,000	2,364,579,000	.....	470,653,000
1915	1,674,170,000	2,768,589,000	.....	1,094,419,000
1916	2,197,884,000	4,333,483,000	.....	2,135,599,000
1917	2,659,355,000	6,290,769,000	.....	3,631,451,000
1918	2,945,655,000	5,919,711,000	.....	2,974,056,000
1919	3,095,877,000	7,225,084,000	.....	4,129,208,000

(a) Includes foreign merchandise re-exported.

COMMERCE OF THE UNITED STATES WITH THE GRAND DIVISIONS OF THE WORLD, 1830 TO 1919.

(000 Omitted).

FISCAL YEARS	Europe		North America		South America		Asia (a)		Oceania (b)		Africa	
	Imports from	Exports to	Imports from	Exports to	Imports from	Exports to	Imports from	Exports to	Imports from	Exports to	Imports from	Exports to
1830	$40,841	$48,175	$17,549	$18,886	$6,239	$4,587	$5,532	$1,845	$385	$94	$309	$234
1840	64,147	98,931	22,628	23,737	9,421	5,970	9,626	2,286	602	455	646	708
1850	124,954	113,862	24,137	24,723	16,648	9,077	10,315	3,052	1,401	208	682	977
1860	216,831	310,272	75,083	53,326	35,993	16,742	26,202	11,068	3,495	5,373	3,799	3,228
1870	249,540	420,184	126,544	68,962	43,596	21,651	31,413	10,972	1,423	7,335	9,860	3,415
1880	370,822	719,434	130,077	69,438	82,127	23,190	67,009	11,646	14,130	6,847	3,789	5,084
1890	449,987	683,736	148,369	94,100	90,006	38,753	67,507	19,697	28,357	16,460	5,085	5,082
1900	440,567	1,040,168	130,035	187,595	93,667	38,946	139,842	64,914	34,611	43,391	11,218	19,470
1905	540,773	1,020,973	227,229	260,570	150,796	56,894	161,983	128,505	25,388	33,079	11,344	18,541
1910	806,270	1,135,915	306,767	385,520	196,165	93,247	193,155	60,862	37,100	50,890	17,490	18,551
1913	892,866	1,079,075	361,944	617,413	217,735	146,148	276,495	115,057	37,543	79,103	26,425	29,089
1914	895,603	1,486,499	427,399	528,645	222,777	124,540	286,952	113,026	42,144	83,568	19,149	27,902
1915	614,355	1,971,435	473,080	477,075	261,490	99,324	247,770	114,470	53,523	77,765	24,953	28,520
1916	616,252	2,999,305	591,896	733,025	391,562	180,175	437,181	278,611	96,226	98,775	64,766	43,591
1917	610,471	4,325,444	766,113	1,164,451	542,213	259,559	615,217	380,320	65,328	111,284	60,013	52,747
1918	411,579	3,732,174	918,347	1,236,359	567,418	314,560	826,194	447,129	146,206	134,891	75,911	54,299
1919	372,954	4,634,817	1,052,570	1,291,932	568,735	400,902	830,904	603,925	190,008	208,351	81,066	85,157

(a) Exports to Asia in 1916 and 1917 include merchandise for Russia via Vladivostok.
(b) Figures subsequent to 1900 do not include trade with Hawaiian Islands.

IMPORTS INTO AND DOMESTIC EXPORTS FROM THE UNITED STATES, BY GREAT GROUPS OF ARTICLES, 1830 TO 1919.

(000 Omitted).

FISCAL YEARS	Crude materials for use in manufacturing		Foodstuffs in crude condition and food animals		Foodstuffs partly or wholly manufactured		Manufactures for further use in manufacturing		Manufactures ready for consumption	
	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports
1830	$4,215	$36,482	$7,382	$2,272	$9,655	$9,557	$5,152	$4,117	$35,735	$5,462
1840	11,510	75,488	15,273	4,565	15,189	15,936	11,359	4,841	44,300	10,584
1850	11,711	83,985	18,012	7,536	21,466	20,017	26,163	6,061	95,312	17,162
1860	39,692	216,010	45,744	12,166	59,838	38,625	34,899	12,642	172,130	35,811
1870	55,615	213,440	54,081	41,853	96,082	50,920	55,569	13,712	173,615	56,329
1880	131,862	238,788	100,297	266,109	118,125	193,353	110,780	29,044	196,587	92,774
1890	170,637	304,567	128,480	132,073	133,333	224,757	116,924	46,455	230,686	132,527
1900	276,241	325,294	97,916	225,906	133,027	319,696	134,222	153,276	203,126	331,746
1905	389,161	472,114	146,131	118,185	145,356	283,065	177,828	209,926	252,373	402,050
1910	566,271	565,935	144,777	109,028	181,567	259,260	285,138	267,766	367,723	499,215
1913	635,210	731,759	211,747	181,907	194,243	321,204	349,402	408,807	408,179	776,297
1914	632,866	792,716	247,948	137,495	227,644	293,218	319,275	374,221	449,318	724,908
1915	575,357	510,456	223,930	506,993	285,725	454,575	327,177	355,862	335,877	807,466
1916	948,826	535,952	251,887	380,638	310,938	599,059	356,857	657,923	311,871	1,998,298
1917	1,109,665	732,389	335,573	532,018	343,474	739,038	477,725	1,191,788	377,662	2,943,923
1918	1,230,252	897,324	372,682	374,978	380,227	1,153,702	540,742	1,201,439	402,670	2,185,420
1919	1,280,715	1,215,962	376,228	719,720	456,241	1,785,180	605,820	952,776	393,195	2,384,801

Prior to the development of the great producing power of the Mississippi Valley imports generally exceeded exports, but when that great area began to pour out its vast production of wheat and corn and meats and livestock and cotton and iron and copper and timber, the exports began to exceed imports, and on several occasions the excess of exports over imports was more than $600,000,000 per annum, and in the 17 years from 1897 to the beginning of the great European War the excess of exports over imports aggregated $8,463,000,000, or an average of practically $500,000,000 per annum. During the war period the excess of exports became much greater, being in 1915 $1,094,000,000, in 1916 $2,136,000,000, in 1917 $3,634,000,000, in 1918 $2,979,000,000 and in 1919 $4,129,000,000. Thus in the period 1900 to 1919 the excess of exports over imports aggregated the enormous sum of $20,741,000,000. As a result there were large imports of gold, especially during the European War, and the excess of gold imports over exports in the fiscal years 1916 and 1917 aggregated more than $1,000,000,000, giving to the United States a stock of gold far in excess of that of any other country of the world.

As to the future of our foreign commerce, it is quite apparent that it will differ materially from that of the past. Manufacturing material and tropical foodstuffs will be our chief requirement from abroad and manufactures the chief material which we can offer in exchange. Practically all of our coffee, tea and cacao come from foreign countries and will so continue indefinitely, while at present we bring about one-half of our sugar from foreign countries and supply the remainder from our own fields and those of our islands. On the export side, we can still supply large quantities of raw cotton, and under pressure of the war we have spared greater quantities of foodstuffs than normal, but it is a startling fact that in the 25 years preceding the present war our exports of manufacturing material and foodstuffs increased but a little over 100 per cent while those of manufactures were increasing over 500 per cent, while a comparison of the exports of manufactures in 1917 with those of earlier years would give an exaggerated percentage of growth. The mere fact that the total exports of manufactures have grown from $1,000,000,000 in 1914 to $4,136,000,000 in 1917 and continued in 1919, after the close of the war, at the rate of about $3,000,000,000 per annum, at least indicates the wonderful expansive power of our manufacturing industries, and suggests the possibility of their being able to greatly enlarge our exports when manufactures necessarily become the chief product which we can spare in exchange for our growing requirements of manufacturing material and tropical food-stuffs.

The 10 great articles of manufacturing materials for which we now rely on foreign countries are wool, silk, fibres, cotton, rubber, hides, copper, tin, gums and nitrates, and the five great articles of food imported are sugar, coffee, tea, cacao and fruits. Of these 10 great articles imported from abroad for manufacturing, our imports in 1917 were $1,060,000,000, against $431,000,000 10 years earlier, and the five great articles of food imported from foreign countries in 1917 were $482,000,000, against $234,000,000 10 years earlier, despite the fact that our islands had practically doubled their contributions of sugar meantime. These 15 absolutely required articles from abroad for use in manufacturing or for food aggregated in round terms $1,500,000,000 in 1917, against $716,000,000 a decade earlier.

Practically all of these great articles which we import either for manufacturing or for food are of tropical or sub-tropical production, and thus come from a section of the world which imports practically all the manufactures which it uses, for, as is well known, the tropics are not manufacturers. All of the $189,000,000 worth of rubber imported by us in 1917 was, of course, tropical, and this is also true of the $231,000,000 worth of sugar, $133,000,000 worth of coffee, $68,000,000 worth of fibres, $40,000,000 worth of raw cotton and $22,000,000 worth of gums, while the $160,000,000 worth of raw silk and $20,000,000 worth of tea was from sub-tropical areas, and more than half of the $216,000,000 worth of hides, and $58,000,000 worth of fruits originated in tropical or sub-tropical countries. Even in the case of the great minerals imported for use in manufacturing, it happens that they come chiefly and almost exclusively from tropical countries; all of the $58,000,000 worth of tin, all of the $44,000,000 worth of nitrates and a large part of the $127,000,000 worth of copper imported in 1917 was mined in tropical countries. We brought into continental United States in the fiscal year 1919 $1,500,000,000 worth of tropical and sub-tropical products other than hides and minerals, against $335,000,000 in 1900 and $640,000,000 in 1910. Thus our purchases of articles of tropical and sub-tropical growth have quadrupled in value since 1900 and doubled since 1910, without having regard to the large increase in hides and minerals from tropical countries and not included in the above figures of imports of articles of tropical growth. In fact, about one-half of our imports from foreign countries in 1919 came from tropical or sub-tropical countries, to say nothing of the nearly $300,000,000 worth which was received from our islands.

More than one-half of our imports come normally from non-manufacturing countries. The world's chief manufacturers are the United States, Great Britain, France, Germany, Italy, Belgium, Switzerland, Austria-Hungary and Japan. These countries are the manufacturing world, the remainder of the inhabited area forms the non-manufacturing world. In 1914, the latest normal year, our imports from the manufacturing countries totaled in round numbers $873,000,000, and from the non-manufacturing world $1,021,000,000. In 1917 our imports from the manufacturing countries were $693,000,000 and from the non-manufacturing world $1,966,000,000. So it may be said in very general terms that while less than 60 per cent of our imports prior to the war were drawn from the non-manufacturing countries, in 1917, with Germany, Austria-Hungary and Belgium out of international trade, over 70 per cent of the greatly increased imports were drawn from the non-manufacturing world.

These non-manufacturing countries from which we now draw three-fourths of our imports have in former years drawn most of their manufactures from Europe, but we have greatly increased our sales of manufactures to them since the beginning of the war. Our exports to the non-manufacturing world, still assuming

that all foreign countries except Great Britain, France, Germany, Belgium, Italy, Switzerland, Austria-Hungary and Japan may be so classed, were in 1914, the year before the war, $1,056,000,000, in 1917 $2,682,000,000, and in 1919 $3,211,000,000, an increase of 200 per cent. And when we consider that manufactures form the bulk of our exports to the non-manufacturing world, and that our exports to that section have increased over 200 per cent during the war period, we may assume that the people in those non-manufacturing countries are getting a much better acquaintance with American manufactures than ever before, and that we may expect to retain after the war a considerable share of the increased export trade in manufactures thus built up, provided our manufacturers take the necessary steps to retain the increase.

Three conditions are required to enable us to retain the gains which we have made in sales of manufactures to the non-manufacturing world—goods made to suit the local markets, sales on longer credits than at home, and prices no greater than those of our rivals having cheaper labor. These require considerable increases of the capital applied to manufacturing for the foreign market. Special manufacturing establishments or parts of establishments must be maintained with which to manufacture the goods in the form required by those markets wherever they differ from those manufactured for our own markets; greater capital with which to give the longer credits required; and an increased application of machinery to the production of manufactures, in order to turn them out at a cost no greater than those produced by the cheaper labor of other countries. This greater use of machinery in manufacturing would not mean any reduction in the amount of labor now employed, but a greater proportion which machinery might produce of the greatly increased output. Our day of exports of foodstuffs and raw materials has passed, except in cases of emergency such as that of the European War, and in the future we must rely upon manufactures to maintain the growth in our exports necessary to retain for us the high rank as an exporter in which we have taken pride and which has given us such prosperity. To do this the manufacturers must give to the foreign trade a greater attention and greater sums of capital than in the past.

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54. INDUSTRIAL AND COMMERCIAL DEVELOPMENT. The chief industrial and commercial development of the United States has occurred since the Civil War. With the termination of that historic struggle which destroyed sectional lines, the reunited nation entered upon the development of the wonderful and varied powers which nature had given the territory which it occupied. With an area nearly equal to that of all Europe, a climate ranging from the temperate to the subtropical, fertile soils which had not yet been made productive, and a great mountain section containing untold quantities of the useful minerals and precious metals, its possibilities of production, manufacture and commerce were apparent to the thoughtful mind.

The first requisite was transportation facilities to enable its various sections to develop and interchange their various products and move the surplus to the water's edge for exportation. The railroads of the entire country were in 1860 but 30,000 miles, in 1865 35,000 and in 1870 52,000 miles and more than one-half of this 1870 total was in the area north of the Ohio River and east of the Mississippi. The great section lying south of the Potomac and the Ohio and sweeping westward from the Atlantic to the western borders of Texas had in 1870 in its nearly 1,000,000 square miles only 13,000 miles of railway, or less than that of the State of Texas to-day, and the great mountain section had but 2,500 miles of road with which to serve its more than 1,000,000 square miles of area.

As a result of these conditions the value of the merchandise sent out of the country in the year 1870 was but $375,000,000, or about one-half as much as that of a single month in 1919, and the value of the merchandise exchanged among the people in the entire country was but about $6,000,000,000, as against more than $60,000,000,000 in 1919.

Clearly the first duty of the country on emerging from the war and "shaking hands across the bloody chasm" was to develop transportation facilities for the great areas north and south whose productive powers were so well established and for whose products the world was beginning to clamor. Fortunately this was rendered possible through the cooperation of capital drawn in part from the older countries of Europe and the loans of capital made by the government, coupled with large land grants for the construction of certain great railway lines, these land grants consisting of the alternate sections of public lands lying on either side of the proposed railways. The public lands granted to the great trans-Pacific lines which reached the western coast in 1869 amounted to over 30,000,000 acres and the total grants authorized by Congressional action amounted to approximately 150,000,000 acres.

The railways of the country which were at the close of the Civil War about 35,000 miles in length grew during the next 15 years at the rate of about 4,000 miles per annum; in the period between 1880 and 1890 the growth was at the rate of about 7,000 miles per annum, and from that time forward at the rate of about 5,000 miles annually. The railway mileage grew from 53,000 miles in 1870 to 167,000 in 1890, 250,000 in 1910 and 270,000 in 1919, against 225,000 in all of Europe in 1919. The cost of this railway system of the United States is estimated at over $20,000,000,000.

Dividing the country into four great natural sections, the north Atlantic, the upper Mississippi, the South and the mountain area (see map on p. 372, vol. 7 of this Encyclopedia) the railways of the north Atlantic section grew from 10,000 miles in 1860 to 35,000 in 1919, the upper Mississippi section from 23,000 miles to 100,000 during the same period, the Southern section from 13,000 to 90,000 miles, and the mountain section from 2,500 miles in 1860 to 45,000 in 1919. This growth included a half dozen distinct east and west lines stretching from the Atlantic to the Pacific and a considerable number of through lines connecting the northern frontage with the Gulf and the

southern border with many interwoven branches making the surface of the country a veritable gridiron of railway lines, especially the area east of the mountain section.

Meantime, the development of the interior of the country was encouraged by other processes. The "Homestead" system, by which citizens or aliens who had declared their intention of becoming citizens might obtain 160 acres of land for a home on payment of $1.25 per acre and an actual residence upon and cultivation of a part of the land, drew millions of families to the interior where these public lands were available and other millions came from Europe to take advantage of this unique opportunity of obtaining homes at a nominal cost. Immigration chiefly from Europe increased from 250,000 in the closing year of the Civil War to 387,000 in 1870, 457,000 in 1880 and 789,000 in 1882, averaging about 500,000 a year down to 1900 and then increasing to over a million a year as the development of the mining and manufacturing industries added to the attractiveness of the opportunities offered.

The great prairies west of the Mississippi which had served in the earlier period as public ranges for large herds of cattle and sheep were gradually divided into farms as the population increased, and the productive power of the interior of the country was thus gradually enlarged. The number of farms in the country grew from 2,000,000 in 1860 to 2,660,000 in 1870, 4,000,000 in 1880, 4,565,000 in 1890, 5,737,000 in 1900 and 6,362,000 in 1910, the latest census year, and the number of persons engaged in agriculture grew from a little less than 6,000,000 in 1870 to 12,659,000 in 1910.

Meantime, the mineral industries developed rapidly. The value of the products of the mines was in 1870 but little more than $200,000,000, advancing to $400,000,000 in 1881, $606,000,000 in 1890, over $1,000,000,000 in 1900, crossing the $2,000,000,000 line in 1912, and exceeding $3,500,000,000 in 1918.

The development of the manufacturing industries was coincidental with that of agriculture and mining, for the factories, of course, required the products of both the farms and the mines. Not only was there plenty of raw material and coal for manufacturing purposes but the fact that manufactures formed two-thirds of the merchandise being imported suggested the importance of producing them at home, especially in view of the abundance of raw material suitable for this purpose. The value of domestic manufactures reported by the census in 1860 was $1,886,000,000, in 1870 $4,232,000,000, in 1880 $5,370,000,000, in 1890 $9,372,000,000, in 1900 $11,406,000,000, in 1910 $20,672,000,000, and in 1915 $24,246,000,000, while those best acquainted with the manufacturing conditions of 1919 estimate that the census of 1920 will show a grand total of $50,000,000,000 worth of manufactures produced in the calendar year 1919, or 12 times as much as that of a half century earlier. The capital invested in manufactures, according to the census reports, grew from $1,000,000,000 in 1860 to $1,700,000,000 in 1870, $2,800,000,000 in 1880, $6,500,000,000 in 1890, $9,800,000,000 in 1900, $18,500,000,000 in 1910 and $23,000,000,000 in 1915. It will be observed that the growth of capital invested in manufactures was much more rapid than the growth in value of manufactures turned out, this rapid increase in application of capital to manufacturing being due to the growing use of machinery in the various industries and permitting the manufacturers of the country to turn out a much greater volume of products than they would otherwise have been able to produce in view of the limitation of their labor supply. The capital of the manufacturing industries, as shown by the census of 1915, was 22 times as much as in 1860, while the labor employed in 1915 was only nine times as much as in 1860, and the value of the manufactures turned out about 15 times as much as in 1860.

These developments of the three great industries, agriculture, mining and manufacturing, have created a great commerce both internal and foreign. The total foreign commerce of the country which was but $317,000,000 in 1850, $687,000,000 in 1860 and $850,000,000 in 1870, crossed the $1,000,000,000 line in 1872, and was $1,500,000,000 in 1880, $1,650,000,000 in 1890, crossing the $2,000,000,000 line in 1900, in which year it stood at $2,244,000,000, then $3,315,000,000 in 1907, advancing to $4,258,000,000 in 1914, and with the increased demands of the war reached $6,531,000,000 in 1916 and $8,865,000,000 in 1918, while the fiscal year 1919 made a still higher record, $10,320,961,000, all of these figures being for fiscal years. The imports grew from $436,000,000 in 1870 to $850,000,000 in 1900, $1,894,000,000 in 1914, all of which preceded the war, $2,946,000,000 in 1918 and $3,095,877,000 in 1919. The exports grew from $393,000,000 in 1870 to $1,394,000,000 in 1900, $2,365,000,000 in 1914, the year preceding the war, jumped to $4,333,000,000 in 1916, $6,290,000,000 in 1917 and $7,225,084,000 in 1919. In the normal period from 1870 to 1914, imports quadrupled and exports sextupled, while during the war period, 1914 to 1919, imports increased about 75 per cent and exports increased about 300 per cent. This very large increase in exports during the war period occurred chiefly in manufactures which grew from a little more than $1,000,000,000 in the fiscal year 1914 to $3,337,576,000 in 1919, thus illustrating the great possibilities of the manufacturing industries of the United States in their power to supply world markets.

These increases in both imports and exports since 1870 are so great as to justify a careful inquiry as to their causes. The growth of exports is perhaps less surprising when it is considered the upper Mississippi Valley with its great possibilities in the production of cereals and meats increased its population from 13,000,000 in 1870 to 30,000,000 in 1914, and its railways from 23,000 miles to 98,000; the South with its great cotton, tobacco and timber areas increased its population in the same period from 12,000,000 to 30,000,000, and its railways from 13,000 miles to 85,000; the great Western area with its minerals, precious metals and livestock increased its population from 1,000,000 in 1870 to 9,000,000 in 1914, and its railways from less than 3,000 miles to 46,000, while the north Atlantic section, the great manufacturing area, increased its population from 12,000,000 to 30,000,000, and its railways from 14,000 miles to 31,000.

UNITED STATES
(Commercial)
SCALE
0 50 100 200 300
240 Statute Miles to one inch
Principal Products ..... COTTON
Navigable Portions of Rivers ....
Most important Railroads .....
Most important Steamship Lines
Latitude North
Longitude West from Greenwich
DOMINION
PACIFIC OCEAN
GULF OF CALIFORNIA
LOWER CALIFORNIA
SIERRA MADRE
MEXICO
OREGON
WASHINGTON
IDAHO
MONTANA
WYOMING
NEVADA
UTAH
COLORADO
ARIZONA
NEW MEXICO
NORTH DAKOTA
SOUTH DAKOTA
NEBRASKA
KANSAS
OKLAHOMA
TEXAS
GRAZING
LUMBERING
MINERALS
WOOL
LIVE STOCK
AND
FRUITS
CORN
SPRING
Vancouver
Puget Sound
Olympia
Seattle
Tacoma
Portland
Salem
Columbia R.
Walla Walla
Spokane
Boise
Pocatello
Butte
Helena
Missoula
Great Falls
Missouri River
Yellowstone
Yellowstone National Park
Sheridan
Bismarck
Fargo
Pierre
Sioux Falls
Aberdeen
Grand Island
Omaha
Lincoln
Cheyenne
Laramie
Denver
Boulder
Colorado Springs
Pikes Peak
Pueblo
Cripple Creek
Leadville
Massive Mt.
Blanca Peak
Trinidad
Raton
Santa Fe
Las Vegas
Albuquerque
Roswell
Cerro Blanco
Amarillo
Canadian
Oklahoma City
Guthrie
Fort Worth
Waco
Austin
San Antonio
Laredo
Matamoros
Saltillo
El Paso
San Angelo
Chihuahua
Guaymas
La Paz
San Jose
Mazatlan
Tropic of Cancer
Reno
Carson City
Sacramento
San Francisco
Monterey
Mt. Shasta
Mt. Whitney
Death Valley
Yosemite Valley
Sierra Nevada
Great Salt Lake
Salt Lake City
Great American Deserts
Humboldt R.
Grand Canyon
Colorado River
San Francisco Mts.
Prescott
Phoenix
Tucson
Gila R.
Rio Grande
Pecos
Pt. Conception
Santa Barbara
Los Angeles
San Bernardino
San Diego
San Pedro Bay
Santa Monica
Tulare Lake
Bakersfield
Mt. Rainier
Mt. Hood
Columbia
Bellingham
Everett
Hoquiam
C. Flattery
C. Blanco
C. Mendocino
6500 ft.
650 ft.
110°
120°
100°
40°
30°

CANADA
Lake of the Woods
Rainy Lake
LAKE SUPERIOR
Duluth
Superior
Sault Ste. Marie
Straits of Mackinac
LAKE MICHIGAN
LAKE HURON
Ottawa River
Quebec
St. Lawrence River
Montreal
Gulf of St. Lawrence
St. John R.
St. John
Halifax
MAINE
Calais
Mt. Desert I.
Augusta
Portland
Concord
Portsmouth
Manchester
Massachusetts Bay
C. Cod
Boston
Providence
New Haven
Long Island
New York
New York Bay
Newark
Trenton
Philadelphia
Wilmington
Baltimore
C. May
Delaware Bay
Toronto
Niagara Falls
Buffalo
Albany
Hartford
Worcester
Lake Champlain
Lake Ontario
Lake Erie
Cleveland
Detroit
Toledo
Erie
Pittsburg
Harrisburg
Scranton
Wheeling
Cumberland
Washington
Annapolis
Dover
Delaware
Columbus
Fort Wayne
South Bend
Chicago
Milwaukee
Madison
Grand Rapids
Lansing
Saginaw
Minneapolis
St. Paul
Winona
Dubuque
Davenport
Rockford
Des Moines
Council Bluffs
Sioux City
Peoria
Springfield
Terre Haute
Indianapolis
Cincinnati
Charleston
Huntington
Frankfort
Lexington
Louisville
Evansville
East St. Louis
St. Louis
Kansas City
Jefferson City
Springfield
Nashville
Knoxville
Chattanooga
Memphis
Fort Smith
Yahlequah
Ozark Mts.
Hot Springs
Little Rock
Pine Bluff
McAlester
Shreveport
Vicksburg
Meridian
Jackson
Birmingham
Montgomery
Atlanta
Augusta
Columbus
Savannah
Charleston
Fernandina
Jacksonville
St. Augustine
Tallahassee
Pensacola
Mobile
Mobile Bay
Baton Rouge
New Orleans
Galveston Bay
Galveston
Houston
Beaumont
Delta of the Mississippi R.
C. St. Blas
Tampa
Tampa Bay
Fort Myers
Miami
C. Canaveral
C. Sable
Key West
Straits of Florida
Nassau
BAHAMA ISLANDS
Havana
CUBA
GULF OF MEXICO
ATLANTIC OCEAN
Raleigh
Richmond
Norfolk
Portsmouth
Roanoke
Asheville
Charlotte
Beaufort
Wilmington
C. Hatteras
C. Lookout
C. Fear
C. Henry
C. Charles
Mt. Mitchell
Appalachian Mts.
Blue Ridge
Tennessee R.
Mississippi R.
Ohio R.
Potomac R.
Rappahannock R.
Roanoke R.
James R.
Susquehanna R.
Delaware R.
Hudson R.
Connecticut R.
Merrimac R.
Kennebec R.
Penobscot R.
Androscoggin R.
Lake Champlain
Lake Ontario
Lake Erie
Lake Superior
Lake Michigan
Lake Huron
Welland Canal
Sault Ste. Marie Canals
Ottawa River
St. Lawrence River
Chesapeake Bay
Albemarle Sound
Pamlico Sound
Long Island Sound
Massachusetts Bay
Delaware Bay
New York Bay
Tampa Bay
Mobile Bay
Galveston Bay
Straits of Florida
Gulf of St. Lawrence
650 ft.
6500 ft.
90°
80°
70°
40°
30°
WHEAT
WINTER WHEAT
SPRING WHEAT
CORN
COTTON
TOBACCO
SUGAR CANE
RICE
FISHERIES
SPONGES
PHOSPHATE
IRON ORE
COAL
LUMBER
WOOD PULP
POTATOES
HAY
DAIRYING
CATTLE
HOGS
SHEEP
WOOL
FRUIT
VEGETABLES
OYSTERS
Copyright, by Rand, McNally & Company

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FISCAL YEARS	
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The result of this increase in population and transportation facilities in the various sections was apparent in the value of the production of these great natural divisions. The value of farm products in the upper Mississippi Valley, including crops and livestock products, increased from approximately $800,000,000 in 1870 to slightly less than $5,000,000,000 in 1910, the latest census year, and, of course, have very greatly increased since that time and especially in the war period; that of the southern section grew from $600,000,000 in 1870 to nearly $3,000,000,000 in 1910; that of the mountain section from $65,000,000 to $800,000,000, while that of the north Atlantic section, chiefly devoted to manufacture and giving little attention to agriculture, increased from approximately $500,000,000 to about $1,000,000,000 in the period 1870–1910. It is proper to add that these figures must be considered as only approximations owing to the changes in census methods from decade to decade which render impossible a close comparison of the figures of the two widely distant periods, 1870 and 1910. In general terms, however, it may be said that the value of the agricultural and livestock products of the upper Mississippi Valley were in 1910 about six times

IMPORTS INTO AND EXPORTS FROM THE UNITED STATES, BY GRAND DIVISIONS, 1850–1919.
(000 Omitted).

FISCAL YEARS	Europe		North America		South America		Asia		Oceania		Africa	
	Imports from	Exports to	Imports from	Exports to	Imports from	Exports to	Imports from	Exports to	Imports from	Exports to	Imports from	Exports to
1850.....	$124,954	$113,862	$24,137	$24,723	$16,647	$9,077	$10,315	$3,052	$1,401	$208	$682	$977
1860.....	216,831	310,273	75,083	53,326	35,993	16,742	26,202	11,068	3,495	5,373	3,799	3,228
1870.....	249,540	420,184	126,544	68,962	43,596	21,651	31,413	10,972	1,423	4,335	9,860	3,415
1880.....	370,822	719,434	130,077	69,438	82,127	23,190	67,009	11,646	14,130	6,847	3,789	5,084
1890.....	449,987	683,736	148,369	94,100	90,006	38,753	67,507	19,697	28,357	16,460	5,085	5,082
1900.....	440,567	1,040,168	130,035	187,595	93,667	38,946	139,842	64,914	34,611	43,391	11,218	19,470
1910.....	806,270	1,135,915	306,767	385,520	196,165	93,247	193,155	60,862	37,101	50,890	17,490	18,551
1913.....	892,866	1,479,075	361,935	617,413	217,735	146,148	276,495	115,057	37,543	79,103	26,425	29,089
1914.....	895,602	1,486,499	427,399	528,645	222,677	124,540	286,952	113,426	42,144	83,568	19,149	27,902
1915.....	614,355	1,971,435	473,080	477,490	261,490	99,324	247,770	114,470	52,523	77,768	24,953	28,520
1916.....	616,253	2,999,305	591,896	733,025	391,563	180,175	437,181	278,611	96,226	98,776	67,766	43,591
1917.....	610,471	4,324,512	766,113	1,163,758	542,213	259,480	615,217	380,250	65,328	109,315	60,013	52,733
1918.....	411,578	3,732,174	918,347	1,236,359	567,418	314,559	826,193	447,329	146,206	134,891	75,912	54,299
1919.....	372,954	4,634,816	1,052,570	1,291,532	568,375	400,902	830,904	603,925	190,008	208,351	81,066	85,157

VALUE OF DOMESTIC MERCHANDISE EXPORTED FROM THE UNITED STATES, BY GREAT GROUPS OF ARTICLES, 1850–1919, SHOWING PERCENTAGE WHICH EACH GROUP FORMS OF TOTAL EXPORTS.

FISCAL YEAR	Total exports of domestic merchandise	Crude material for manufacturing	% of total	Foodstuffs crude	% of total	Foodstuffs manufactured	% of total	Manufactures for use in manufacturing	% of total	Manufactures ready for use	% of total
1850..	$134,901,000	$83,985,000	62.3	$7,536,000	6.0	$20,017,000	14.8	$6,061,000	4.5	$17,162,000	12.7
1860..	316,342,000	216,010,000	68.3	12,160,000	3.9	38,625,000	12.2	12,672,000	4.0	35,811,000	11.3
1870..	370,616,000	213,440,000	56.7	41,853,000	11.1	50,920,000	13.5	13,712,000	3.7	56,329,000	15.0
1880..	823,946,000	238,788,000	29.0	256,109,000	32.3	193,353,000	23.5	29,044,000	3.5	92,774,000	11.3
1890..	845,294,000	304,567,000	36.0	132,073,000	15.6	224,757,000	26.6	46,455,000	5.5	132,527,000	15.7
1900..	1,370,764,000	325,244,000	23.7	225,906,000	16.5	319,696,000	23.3	153,275,000	11.2	331,746,000	24.2
1910..	1,710,084,000	565,935,000	33.1	109,828,000	6.4	259,260,000	15.7	267,766,000	15.7	499,215,000	29.2
1913..	2,428,506,000	731,759,000	30.1	181,907,000	7.5	321,204,000	13.2	408,806,000	16.8	776,297,000	32.0
1914..	2,329,684,000	792,716,000	34.0	137,495,000	5.9	293,218,000	12.6	374,224,000	16.1	724,908,000	31.1
1915..	2,716,178,000	510,456,000	18.9	506,993,000	18.7	454,575,000	16.7	355,862,000	13.1	807,466,000	29.7
1916..	4,272,177,000	535,952,000	12.6	380,638,000	8.9	599,059,000	14.0	657,923,000	15.4	1,998,298,000	46.8
1917..	6,227,164,000	731,990,000	11.8	531,806,000	8.5	737,795,000	11.9	1,191,262,000	19.1	2,942,577,000	47.3
1918..	5,838,652,000	897,324,000	15.3	374,978,000	6.4	1,153,702,000	19.8	1,201,439,000	20.6	2,185,420,000	37.4
1919..	7,074,012,000	1,215,961,000	17.2	719,716,000	10.2	1,785,180,000	25.2	952,776,000	13.5	2,384,801,000	33.7

VALUE OF MERCHANDISE IMPORTED INTO THE UNITED STATES, BY GREAT GROUPS OF ARTICLES, 1850–1919, SHOWING PERCENTAGES WHICH EACH GROUP FORMS OF TOTAL IMPORTS.

FISCAL YEAR	Total imports	Crude material for use in manufacturing	% of total	Foodstuffs crude	% of total	Foodstuffs manufactured	% of total	Manufactures for use in manufacturing	% of total	Manufactures ready for use	% of total
1850..	$173,510,000	$11,711,000	6.8	$18,012,000	10.4	$21,466,000	12.4	$26,163,000	15.1	$95,312,000	54.9
1860..	353,616,000	37,073,000	10.5	35,744,000	10.1	53,771,000	15.3	23,613,000	6.7	199,879,000	56.5
1870..	435,958,000	53,119,000	12.2	53,981,000	12.4	96,254,000	22.1	54,545,000	12.5	173,034,000	39.7
1880..	667,955,000	131,862,000	19.7	100,297,000	15.0	118,125,000	17.7	110,780,000	16.6	196,587,000	29.4
1890..	789,310,000	170,637,000	21.6	128,480,000	16.3	133,332,000	16.9	116,924,000	14.9	230,686,000	29.2
1900..	849,941,000	276,241,000	32.5	97,916,000	11.5	133,027,000	15.7	134,222,000	15.8	203,126,000	23.9
1910..	1,556,947,000	566,271,000	36.4	144,777,000	9.3	181,567,000	11.7	285,138,000	18.3	367,723,000	23.6
1913..	1,813,008,000	635,210,000	35.1	211,747,000	11.7	194,243,000	10.7	349,402,000	19.3	408,179,000	22.5
1914..	1,893,926,000	632,866,000	33.4	247,948,000	13.1	227,644,000	12.0	319,275,000	16.8	449,318,000	23.7
1915..	1,674,170,000	575,357,000	34.4	223,230,000	13.4	285,725,000	17.1	237,177,000	14.1	335,877,000	20.0
1916..	2,197,884,000	948,825,000	43.2	251,887,000	11.5	310,983,000	14.2	356,857,000	16.2	311,871,000	14.2
1917..	2,659,155,000	1,109,704,000	41.2	335,573,000	12.6	343,435,000	12.9	477,731,000	18.0	377,257,000	14.2
1918..	2,945,655,000	1,230,252,000	41.8	372,682,000	12.7	380,227,000	12.9	540,742,000	18.4	402,670,000	13.7
1919..	3,095,877,000	1,250,713,000	40.4	376,228,000	12.2	456,241,000	14.7	605,826,000	19.6	393,195,000	12.7

Note the increasing share which raw manufacturing material and the decreasing share which finished manufactures, respectively, form of the total merchandise imported.

Relative Development of Agriculture and Manufacturing in the United States 1850 to 1915.

Census Year	Number of establishments		Persons employed		Capital employed		Value of output		Value of output per employee	
	Farms	Manufacturing establishments (b)	Persons engaged in agriculture	Wage earning in manufacturing establishments	Census value of farms	Census figures of capital in manufacturing	Value of farm products	Value of manufactures	Farms(e)	Manufacturing establishments
1850	1,449,000	123,005	(a) 2,763,000	957,000	$3,967,000,000	$533,000,000	(a) $1,003,000,000	$1,019,000,000	$362	$1,064
1860	2,044,000	140,443	(a) 3,960,000	1,311,000	7,980,000,000	1,009,000,000	(a) 1,300,000,000	1,886,000,000	329	1,447
1870	2,660,000	252,148	5,922,000	2,054,000	8,944,000,000	1,695,000,000	1,958,000,000	4,232,000,000	332	2,060
1880	4,008,000	253,802	7,713,000	2,733,000	12,180,000,000	2,790,000,000	1,212,000,000	5,369,000,000	298	1,975
1890	4,565,000	355,405	8,565,000	4,252,000	16,080,000,000	6,525,000,000	2,460,000,000	9,372,000,000	299	2,209
1900	5,737,000	512,191	10,382,000	5,306,000	20,439,000,000	9,814,000,000	4,717,000,000	(d) 13,000,000,000	469	(d) 2,472
1910	(c) 6,362,000	575,300	12,659,000	(d) 7,116,000	40,991,000,000	(d) 19,428,000,000	8,498,000,000	(d) 22,100,000,000	629	(d) 3,105
1915	(a) 6,718,000	(c) 590,200	(a) 14,021,000	(d) 7,650,000	(a) 50,000,000,000	(d) 23,791,000,000	10,774,000,000	(d) 26,300,000,000	(a) 769	(d) 3,438

(a) Estimated.
(b) Includes hand trades and neighborhood industries; census figures to 1900; estimates of hand trades 1910 and 1915.
(c) Hand trades and neighborhood industries estimated.
(d) Includes estimate for hand trades, included in census figures prior to 1900.
(e) Does not include food consumed on farms; hence the relatively low output per capita as compared with manufactures.

Industrial Development of the United States 1870 to 1915 by Great Producing Areas (a).

	North Atlantic area			Upper Mississippi Valley			Southern area			Mountain area		
	1870	1915	Per ct. increase	1870	1915	Per ct. increase	1870	1915	Per ct. increase	1870	1915	Per ct. increase
Population	12,442,000	30,132,000	142	12,981,000	32,648,000	152	12,012,000	32,839,000	173	990,000	9,048,000	813
Railroads; miles	14,400	30,635	113	22,850	98,290	330	13,280	83,200	525	2,550	42,560	1570
Farms: acres	63,500	64,000	1	139,100,000	350,300,000	151	187,400,000	352,900,000	89	15,400,000	99,300,000	544
Value (b)	$3,206,000,000	$3,658,000,000	14	$4,314,000,000	$22,562,000,000	431	$1,561,000,000	$8,480,000,000	424	$177,000,000	$4,421,000,000	2410
Products	513,000,000	778,000,000	51	784,000,000	4,260,000,000	447	604,000,000	2,684,000,000	346	56,000,000	709,000,000	1166
Manufactures: output	2,695,000,000	11,073,000,000	312	1,070,000,000	8,569,000,000	701	372,000,000	3,077,000,000	727	103,000,000	1,707,000,000	1519
Capital	1,336,000,000	10,850,000,000	719	522,000,000	7,338,000,000	1305	180,000,000	2,894,000,000	1446	60,000,000	1,728,000,000	2780

(a) See map page 372, Vol. 7, for boundaries of divisions.
North Atlantic area: New England and Middle States.
Upper Mississippi: North of Ohio River from Pennsylvania to Colorado.
Southern area: All States south of Ohio and Potomac rivers west to Arizona.
Mountain area: All States west of Texas, Kansas, Nebraska and the Dakotas.
(b) Includes buildings and livestock.

as much as in 1870, that of the South about five times as much, that of the mountain regions 12 times as much, while that of the north Atlantic region, the great manufacturing area, barely doubled, and the area of this north Atlantic section devoted to agriculture was practically unchanged, the tendency of the "New England Farm" to deteriorate rather than to advance its power of production being well recognized by the students of industries of the country during the period in question.

MANUFACTURES PRODUCED IN THE UNITED STATES, 1850 TO 1915; ALSO VALUE OF MANUFACTURES EXPORTED AND IMPORTED.

(Values of production are those at the factory; those of exports are values at the port of exportation; those of imports are prices in country from which sent to the United States).

CENSUS YEAR	Manufactures produced	Manufactures exported (b)	Manufactures imported
1850....	$1,019,000,000	$43,238,000	$121,475,000
1860....	1,886,000,000	87,078,000	222,792,000
1870....	4,232,000,000	120,661,000	227,579,000
1880....	5,369,000,000	315,171,000	307,367,000
1890....	9,372,000,000	423,739,000	347,610,000
1900....	(a)11,406,000,000	804,717,000	337,348,000
1910....	(a)22,100,000,000	1,026,251,000	652,861,000
1915....	(a)26,300,000,000	1,617,903,000	573,054,000

(a) Includes estimate for home trades and neighborhood products, included in census reports prior to 1900.
(b) Includes manufactured foodstuffs, in order to render figures comparable with census figures of manufactures produced, which include manufactured foodstuffs.

The progress in manufacturing in the various great areas is equally interesting. The value of manufactures produced in the United States was shown by the census of 1870 at $4,232,000,000, and the output of 1914 was recorded by the 1915 census at $24,246,000,000, though the latter figure omitted the product of the hand trades and neighborhood industries which were included in the 1870 census, and which if included in the 1914 figures would have brought the total value of products up to fully $26,300,000,000 in 1914, as against $4,232,000,000 in 1870. The value of the manufactures of the entire country in 1914 may, therefore, be said to have been more than six times as great as in 1870, while the value of the farm products in 1910 (the last census year) was about four and one-half times as much as in 1870, indicating that the growth in manufactures has been greater proportionately than that of agriculture. The North Atlantic section increased its output from $2,750,000,000 in 1870 to $11,000,000,000 in 1914; the upper Mississippi section from slightly less than $1,000,000,000 in 1870 to $8,575,000,000 in 1914, the South from $350,000,000 to $3,130,000,000 during the same period, and the mountain section from $100,000,000 in 1870 to $1,500,000,000 in 1914. The north Atlantic section gained about $8,250,000,000, the upper Mississippi Valley about $7,500,000,000, the South about $2,750,000,000, and the mountain section about $1,400,000,000. In the north Atlantic section the value of the imports turned out in 1914 was about four times as much as in 1870; in the upper Mississippi section the value of manufactures in 1914 was more than eight times that of 1870; in the South about nine times as much, and in the mountain region about 15 times as much as in 1870. The north Atlantic section produced about 65 per cent of the manufactures in 1870 and but 45 per ceht in 1914; the upper Mississippi produced about 23 per cent of those of 1870 and 35 per cent of those of 1914; the South about 7 per cent in 1870 and 14 per cent in 1914, and the mountain region about 3 per cent in 1870 and 7 per cent in 1914.

It is proper here to again call attention to the fact that the figures of production of manufactures in the various sections are materially affected by the fact that the census reports call all products of slaughtering, milling and dairy products as "manufactures," which gives to the upper Mississippi section a larger share of the total manufactures of the country than would be the case if the groups ordinarily considered as "manufactures" were included. The flour, meat and dairy products included in the census classification of "manufactures" aggregated in 1914 about $3,000,000,000, forming about 13 per cent of the census valuation of manufactures turned out in that year, and as most of these originated in the upper Mississippi Valley they materially increased the percentage with which that section is accredited in the figures of manufactures produced. If these three groups, flour, meats and dairy products, were omitted from the general list of manufactures, the share which the upper Mississippi Valley produced and the remaining $21,000,000 of manufactures would be approximately 31 per cent instead of 36 per cent as shown in the grand totals of the census which includes these three groups of foodstuffs as manufactures, although the labor performed in making them "manufactures" is comparatively slight. The value added to the raw material by the manufacturing process, according to the census figures, is in the case of flour, meats and dairy products but about 15 per cent, while in all other manufactures the share added to the value of the raw material by the manufacturing process is approximately 80 per cent.

The growth in manufacturing has been the most striking characteristic of the industries and commerce of the United States. This is especially true of the more recent period. Manufactures formed but 45 per cent of the products of the country in 1850, 53 per cent in 1860 and 58 per cent in 1870. By 1880 they had so gained in their growth over the other chief product, that of agriculture, that they formed 65 per cent of the total production of the country and have remained at about that ratio in the census records since that time with the exception of 1890 when farm products were below normal, thus making the share which manufactures formed of the total production slightly more than 70 per cent. Meantime with the growing demand of our own people upon the agricultural area and the trend of the farming population toward the cities and manufacturing towns, the share which agricultural products formed of the total exports has steadily decreased despite the increased value of the total output, most of which was consumed with the country. Agricultural products, according to an estimate made by the Agricultural Department from year to year, formed approximately

84 per cent of the exports of the country in 1880, 75 per cent in 1890, 62 per cent in 1900, 51 per cent in 1910, 46 per cent in 1913, the year

VALUE OF FARM PRODUCTS IN THE UNITED STATES AND OF AGRICULTURE PRODUCTS EXPORTED AND IMPORTED 1850 TO 1918.*

(Census figures of farm products to 1910; estimate of Department of Agriculture for later years; Department of Agriculture figures on value of agricultural products exported).

	Value of farm products	Agricultural exports	Agricultural imports
1850	(a)$1,003,000,000	(c)$149,000,000	(c)$81,726,000
1860	(a)1,300,000,000	260,280,000	129,816,000
1870	1,958,000,000	296,962,000	191,559,000
1880	1,212,000,000	694,314,000	314,617,000
1890	2,460,000,000	634,408,000	384,100,000
1900	4,717,000,000	844,616,000	420,139,000
1910	8,498,000,000	871,158,000	687,509,000
1913	(b)9,850,000,000	1,123,601,000	815,300,000
1914	(b)9,894,000,000	1,113,900,000	924,127,000
1915	(b)10,774,000,000	1,575,937,000	910,876,000
1916	(b)13,406,000,000	1,518,071,000	1,189,704,000
1917	(b)19,331,000,000	1,968,253,000	1,404,972,000
1918	(b)21,386,000,000	2,281,338,000	1,614,220,000

* Valuation of farm products of United States are those at the farm; the export values are those at port of exportation; the import values are those in the country from which the merchandise was exported to the United States.
(a) Estimated.
(b) Department of Agriculture estimate of wealth produced on farms.
(c) 1855; no data for 1850.

before the war, and 31 per cent in 1917, this sharp fall in the percentage during the war being chiefly due to the great increase in the exportation of manufactures for war purposes. Meantime manufactures which formed but 15 per cent of the exports in 1860 and 18 per cent in 1870 were 20 per cent in 1890, 26 per cent in 1900, 45 per cent in 1910, 48 per cent in 1913, 66 per cent in 1917 and about the same in 1919.

This large increase in manufacturing in the United States has had a perceptible effect on the imports for certain of the manufacturing material must be drawn from abroad even in a country of such varied production as in the United States. All of the raw silk, most of the fibres, one-half of the wool, all of the tin and a small percentage of the cotton used in the factories are necessarily brought from abroad, since we produce no silk, or jute, or sisal, or Manila hemp, or tin and only one-half of the wool which we require. As a consequence the imports of raw material for manufacture increased from $50,000,000 in 1870 to $132,000,000 in 1880, $276,000,000 in 1900, $566,000,000 in 1910, $635,000,000 in 1913, $1,230,000,000 in 1918, and $1,250,715,000 in 1919.

Our demands upon foreign countries have increased in foodstuffs as well as in manufacturing materials. We bring into the country all of the coffee and tea and cacao which our people consume, also about 50 per cent of the sugar consumed, while another 25 per cent comes from our own islands, Porto Rico and Hawaii, but is not classed as an import since those islands are customs districts of the United States and the merchandise coming from them not classed as imports. Our importation of foodstuffs, exclusive of that from our own islands, has increased from $150,000,000 in 1870 to $327,000,000 in 1910. $475,000,000 in 1914 and $760,000,000 in 1918. Quite naturally the manufactures imported showed a much slower increase in view of the enormous quantities of manufactures turned out by our own factories, the value of finished manufactures imported having advanced from $173,000,000 in 1870 to $203,000,000 in 1900, $360,000,000 in 1912 and $499,000,000 in 1914, dropping to $403,000,000 in 1918, and $393,000,000 in 1919, this reduction being due chiefly to the fact that the European countries from which we had drawn most of our manufactures were not in position at the close of the war to export any considerable quantity of the products of their factories. The share which finished manufactures formed of the total imports of the country fell from 40

VALUE OF MERCHANDISE IMPORTED INTO AND EXPORTED FROM THE UNITED STATES, 1790–1919.
(000 OMITTED).

FISCAL YEAR	Exports			Imports	Excess of	
	Domestic	Foreign	Total		Exports	Imports
1790	$19,666	$539	$20,205	$23,000	.....	$2,795
1800	31,841	39,131	70,972	91,253	.....	20,281
1810	42,367	24,391	66,758	85,400	.....	18,642
1820	51,684	18,008	69,692	74,450	.....	4,758
1830	58,525	13,146	71,671	62,721	$8,950	.....
1840	111,661	12,008	123,669	98,259	25,410	.....
1850	134,900	9,475	144,376	173,510	.....	29,134
1860	316,342	17,334	333,576	353,616	.....	20,041
1870	376,616	16,155	392,772	435,958	.....	43,186
1880	823,916	11,692	835,639	667,955	167,684	.....
1890	845,294	12,535	857,829	789,310	68,518	.....
1900	1,370,764	23,720	1,394,483	849,941	544,542	.....
1910	1,710,084	34,901	1,744,985	1,556,947	188,037	.....
1913	2,428,506	37,378	2,465,844	1,813,008	652,876	.....
1914	2,329,684	34,895	2,364,579	1,893,926	470,653	.....
1915	2,716,178	52,411	2,768,589	1,674,170	1,094,420	.....
1916	4,272,178	61,305	4,333,483	2,197,884	2,135,599	.....
1917	6,227,164	62,884	6,290,048	2,659,335	3,630,693	.....
1918	5,838,652	81,059	5,919,711	2,945,655	2,974,056	.....
1919	7,074,012	151,073	7,225,084	3,095,877	4,129,208	.....

per cent in 1870 to 24 per cent in 1900, 22 per cent in 1912, 14 per cent in 1918 and 13 per cent in 1919, while the share which raw material for manufacturing formed of the imports increased from 13 per cent in 1870 to 32 per cent in 1900, 42 per cent in 1918 and 40 per cent in 1919.

Probably not more than about 5 per cent of our manufactures are exported in normal years, though this can be only a rough approximation, as this question, although extremely important, is at the same time extremely difficult to answer in exact terms. The census, herewith indicated, includes in its classification "manufactures" many articles prepared for food which are not included in the government's classification of "manufactures" exported. Meats, flour, dairy products and certain other articles which the census classes as "manufactures" are classed by the Department of Commerce in its export figures under the general heading of "Foodstuffs." In order, however, to render comparable the figures of the census with those relating to imports and exports, the Bureau of Statistics a few years ago readjusted its classifications, dividing "foodstuffs" into two groups, one of which included all manufactured foodstuffs. It is possible, therefore, by combining the export group "foodstuffs partly or wholly manufactured" with the two groups "manufactures for further use in manufacturing" and "manufactures ready for use" to obtain a total which represents all articles classed by the census as "manufactures." Another difficulty which arises in attempting to compare this aggregation of the three groups with the full census classification of manufactures produced lies in the fact that the census valuation of manufactures produced is the value at the factory at the time of production, while the Department of Commerce figures of valuation of the merchandise when exported is the value at the port from which sent out of the country at the date of exportation. It thus happens that, necessarily, the valuation placed upon the manufactures when exported is in most cases somewhat in excess of that named by the manufacturer in his report to the Census Bureau, since the cost of transportation from the factory to the port of exportation would necessarily be added and in many instances the profits of the persons who may have purchased them from the manufacturer for exportation. Comparisons, therefore, of the Department of Commerce valuation of manufactures exported with the census valuations of manufactures produced must be made with the clear understanding that the valuation of the merchandise exported is probably somewhat in excess of that named for the same articles by the manufacturer who reported to the census its value at the door of the factory. Even with this increased valuation necessarily included in the export figures, the ratio which the total value of manufactures exported bears to the total valuation of manufactures produced in the country is extremely small, having averaged slightly less than 5 per cent during the entire period from 1860 to 1915, the percentage which the value of manufactures exported bore to the census valuation of manufactures produced having been in 1870 3.1 per cent, in 1890 4.3 per cent, in 1905 4.7 per cent, in 1910 4.9 per cent, advancing to 6.7 per cent in 1915, when the demands of the war brought the exports of manufactured foodstuffs to an abnormally high figure.

Manufactures are the future hope of the foreign commerce of the United States. While it is true that the country responded generously to the calls of Europe for foodstuffs during the World War it is also true that our growing population demands a constantly increasing share of our agricultural products, while the very great increase which was made in manufacturing for exportation during the war suggests almost unlimited possibilities in the power of production of manufactures in the United States and especially so in view of the increasing use of capital in the form of machinery in the factories of this country, an increase much more rapid than that of other countries. Estimates by the best experts put the total value of manufactures in the United States in 1919 as probably about $50,000,000,000, while the exports of manufactures in the fiscal years 1918 and 1919 have in each case exceeded $3,000,000,000 as against about $1,000,000,000 per annum in the period immediately preceding the war. The world had made a much better acquaintance with United States manufactures during the war period than ever before for we were supplying in the calendar year 1918 nearly or quite one-half of the manufactures entering international trade as against about one-sixth prior to the war and with the plentiful supply of capital available our manufacturers should have no difficulty in so increasing the use of machinery in their factories as to enable them to turn out their products at as low a cost as those of the countries having a cheaper labor supply but less plentiful supply of capital, and thus assure to the United States a steady growth in manufacturing and in exportation of the products of our factories.

O. P. AUSTIN,
Statistician, National City Bank, New York.

55. ARMY OF THE UNITED STATES. The army of the United States was the legitimate descendant of the old militia organizations maintained in the various colonies prior to the Revolution. The nucleus of the regular army of the nation was the small force of riflemen authorized by the Colonial Congress on 14 June 1775 to serve the United Colonies. Beginning then and continuing to the present the military forces of the United States consist of a regular army maintained by the Federal government and a system of State troops called for a long time the Militia and later the National Guard. When these forces were found insufficient, volunteers have been called for or armies have been raised by draft. The country has never authorized compulsory universal military service and in peace times it has always been difficult to win away from civilian pursuits enough men to maintain either the regular army or the State forces. The country has always shown a just pride in the small regular army, but service in its ranks has never been popular. The splendid opportunities offered to healthy young manhood by the rapid development of the economic life of the new country left few youths seeking long term enlistment in regular regiments. The nation has never been enthusiastic in its attitude toward the army and such military enthusiasm as existed naturally found a congenial opportunity in the militia.

Thus the dual services intended to co-operate and supply whatever military needs might arise gradually became competitors, not of course in efficiency but in the quest for men to serve.

Washington, the most popular commander the army ever had, complained constantly that men preferred service in the less efficient militia to that of the continental line regiments. In every war where the regular troops have required the co-operation of the militia the early antagonism has found fresh expression and the problem of the regular army has been less that of learning how to fight a foreign foe than to discover some means of getting rid of the militia incubus. It is undeniable that the nation has never supported a regular army comparable to its population or its wealth. Safeguarded by its political isolation for a century no disaster resulted and it suited the popular prejudice to assume that the militia would be ready when wanted.

The establishment of a national army school in 1802 at West Point under the title of The United States Military Academy led to the development of the only military caste in the nation. The small groups of boys educated there to become officers in the regular army passed out of its graduating classes and disappeared into remote little army posts. As professional soldiers they knew the danger of the situation, but they always lacked numbers or influence to persuade the nation that the militia might prove a dangerously weak element in the scheme of national defense if a great danger should suddenly arise. For more than a hundred years no great external danger ever did arise and government and people smiled complacently upon the militia and turned a deaf ear to the warnings or complaints of the regular. As a matter of fact the history of our wars proves that we have been always the winners, even when our fighting has been most inferior and our military measures totally inadequate. Fate made the country a nation of optimists, confident that we could win wars almost without soldiers. The history of the militia in the early days of the colonies laid the foundation for this public obsession. In those times the settlers either combined for local defense or co-operated in larger groups when necessary to defend the frontiers of their colony.

When larger dangers threatened, as more particularly in the time of the French and Indian wars, several colonies contributed detachments of some strength which joined the regular British troops and served under their commanders. It is well worth while to remember that the history of those early campaigns against the Indians, and later against the French and Indians, showed a marked superiority on the part of the colonial militia over the professional soldiers trained in European schools of war. Neither lacked courage or hardihood, but the militia knew how to fight the Indian and the regular soldier did not. The militia were fighting to hold back a foe who threatened soon to be ravaging the whole country, and so brought their whole-hearted devotion to the cause. When the struggle against England began in the first days of the Revolution the militia rallied at a moment's notice and fought British regulars, retreating from Concord, with as great skill and courage as they had displayed a generation earlier when covering the retreat of British regulars after the disastrous defeat of Braddock at Fort Duquesne. The minute men who inflicted heavy casualties upon the British column trying to fight their way back to Boston on 19 April 1775, gave every evidence of being worthy descendants of those other militiamen who had shown such splendid capacity for hard fighting against odds in the attacks upon the powerful fortifications at Louisburg in 1745, and again in 1758. Two months after the affair at Concord and Lexington we find the militia of the New England provinces gathered in intrenched positions on Bunker Hill. Here their 1,500 hastily organized unprofessional soldiers fought the famous battle against veteran regular troops who outnumbered them two to one. The British troops, all regulars, at Bunker Hill fought an American force composed entirely of militiamen. The British losses (89 officers and 965 men) were nearly 50 per cent greater than in any later action in the seven years' war. The losses of the American militia were 449 in all, and occurred mostly when, with ammunition exhausted, they were compelled to retreat across exposed ground.

After the Battle of Bunker Hill the Continental Congress at Philadelphia perceiving that the war would not be confined to New England authorized the adoption of the forces already in the field as a Continental Army, owing allegiance to the United Colonies. On 14 June 1775 authority wes voted for the raising of 10 companies of riflemen in Pennsylvania, Maryland and Virginia to serve one year. These troops formed the nucleus of the Continental Army or regular forces of the United States, as we have come to call our national troops. On 15 June 1775 George Washington was appointed commander-in-chief, and on 3 July at Cambridge, Mass., he took command of the 17,000 militiamen engaged in the investment of Boston.

From that time on a bitter conflict has continued between the regular and the militiaman, and the literature of our professional army has for more than a century lamented that the early history of the country gave rise to a confidence in and reliance upon the State militia forces, which has contributed to the defeat of the hundreds of measures proposed for the creation of an adequate regular army. General Washington unquestionably was distinctly opposed to the use of the militia in the struggle against the British armies and frequently reiterated his belief that the cause of the colonies was likely to be lost unless Congress would raise a sufficient permanent force, enlisted for a term of several years and owing allegiance to the central government only. Washington was not a soldier by profession, although he had served in the Virginia militia and had distinguished himself in the French and Indian War. He was a man of the highest personal integrity and singularly pure in character, and these qualities won for him the respect and confidence which enabled the widely diversified elements in the new union to unite upon him as an acceptable leader. He won no great military victories and he suffered many humiliating defeats, but he held the love and faith of all parties at all times. Under his leadership the discouraged and often wavering forces held together in sufficient numbers to keep the field, until after the lapse of years which had seemed hopeless, French fleets and

armies came to help turn the tide from defeat to victory. In August 1776 Washington had on Long Island a paper strength of 27,000, but when the battle developed he could oppose only 8,000 combatants to Lord Howe's 20,000 British troops. The loss of that battle and the subsequent reverses enabled the enemy to expel the Continental forces from both New York and New Jersey. Washington's complaint against the militia was based upon the short and variable terms of their service. The Continentals were enlisted at first for two years and later for three years and as the armies were composed of both Continentals and militia the plans of the commander were constantly complicated by the ever approaching departure of some of the militia units. Throughout the war the American forces when operating without foreign help were singularly unsuccessful, except in minor or surprise attacks as at Ticonderoga, Stony Point, Trenton and Monmouth. The one notable exception was the brilliant victory at Saratoga when on 17 Oct. 1777, the British army under Burgoyne surrendered to an overwhelming force of militia rallied to the defense of Northern New York under Gates, Arnold, Morgan and Schuyler.

The militia were frequently proved unreliable and it is equally true that the Continentals wrote fewer victories on their colors than might have been expected of trained troops recruited from a brave and ambitious people.

The burden of Washington's complaint was that the shorter service offered in the militia, usually three, six or nine months, proved much more attractive to most men and that consequently it was difficult to get sufficient good men to enter the regular service. The history of the war proves that when the circumstances would permit a quick assembling and a short campaign the militia were as brave and efficient as ever.

On the other hand, they were totally inefficient and unreliable when called upon to submit to the long and trying periods of inactive camp or garrison life.

We have indulged in this comment upon the early rivalry between the regulars and the militia because it gave rise to a situation which has persisted and has embarrassed every army administration from 1775 to the present.

In some of the darkest years of the Revolution there were more Continentals on the army pay roll than there were British troops in America and yet the effort has always been to put the blame for the failures of those years upon the militia.

Since then the claim has always been in every stage of army existence that the army itself would have been a better and more efficient instrument if the militia had been abolished. Nevertheless the States and the United States have continued to maintain the militia so that it is apparent that in the view of the country at large this branch of the military service has really been much less unworthy than it has been declared to be by its professional army critics.

In the War of 1812 the whole operations of the land forces might be admitted to have contributed little or nothing to the ultimate victory. The militia were frequently inefficient and the regulars won no decisive campaigns.

The Indian wars were frequent, sometimes lengthy and always more costly than they would have been if the country had kept ready for all emergencies a strong regular army. The Mexican War was a brilliant chapter in the history of our army which carried an aggressive and uniformly successful campaign through great physical difficulties to complete success.

The Civil War disclosed the fact that whereas the government school at West Point had produced a fine standard of professional efficiency among officers, it had not so far nationalized them that all could be depended upon to join a national issue when opposed to sectional interests. Many of the most capable officers were from southern States and resigning their commissions in the United States army they took service in the Confederacy and supplied the skilful leadership which kept the War raging for four years. The regular army supplied but a small fraction of the great armies called out between 1861 and 1865 and the vast majority of both officers and soldiers joined the colors utterly devoid of previous military training.

For many years preceding the Civil War there had been no need of the militia and in consequence it had degenerated into a practically worthless military asset. The State records exhibited a considerable paper strength but the regiments were little more than picturesque features for Fourth of July parades. When the Civil War made its demand for men in large numbers the early campaigns showed clearly that the previous decades had seen the development of prosperous communities and the decay of militant virtues.

The progress of the war with its long hard campaigns of varying fortune demonstrated that the nation both North and South still possessed the raw material out of which fine armies could be raised.

When the war ended in 1865 great armies of splendid veteran soldiers returned to the pursuits of peace. The credit for most of the skill in training and leading those armies belongs to officers who had been educated in the regular service. Many thousands of capable and brilliant officers came green into the service and learned the science of war on the battlefields, but until they had learned they were nearly as dangerous to their own men as were the enemy.

The Indian Wars which followed the Civil War were entrusted almost entirely to the small regular army which was for many years kept constantly in the far west. A very high degree of efficiency for border warfare was developed but the conditions were decidedly unfavorable to the study of modern warfare between civilized powers.

The sudden outbreak of war with Spain in 1898 made it necessary to call into the National service the National Guard of the States as well as a numerous volunteer army. The National Guard in a few of the States was a fairly well organized and partly trained force but in many of the States neither officers nor men had more than the most elementary preparation for service in war.

Fortunately the campaign in Cuba was a very brief one and the fine aggressive spirit of the small regular army caused the Spanish defense to crumple up with very little hard fighting.

The large forces gathered in training camps

in the States suffered heavy losses from camp diseases and showed every evidence that they would have needed much training before they could have been described as parts of an efficient and disciplined military force. The Spanish War while brief and rather trivial in the nature of its one short campaign did the country a great deal of good. The old notion that no foreign complications could ever disturb the peace of the United States was rudely and quite effectually uprooted. The country was ready to believe that there was need to support a somewhat larger regular army and to give more attention to all of our military interests. The condition of the state troops had been shown to be far from any reasonable degree of efficiency. The next 20 years witnessed a great improvement in the quality of the National Guard in several of the States but in many places the organization continued to merit the criticism which the professional aimed at its glaring faults. Those criticisms were often permitted to seem to apply to all the forces in all of the States and the result was an unfortunate antagonism between the regular establishment and the National Guard which was hurtful to both.

The war in the Philippines meanwhile gave the regular army its first experience of foreign service but unfortunately the lessons learned there were too much like our own old campaigns in the Florida and other Indian Wars. A number of special service volunteer regiments were raised to augment the regulars in the Philippines and these regiments carefully trained to regular army standards gave excellent service.

The punitive expedition into Mexico in 1916 was in the nature of a cavalry reconnaissance by a strong regular column against guerilla forces and provided little experience of value for the great conflict in Europe. The mobilization of the National Guard taught the States many lessons of value and helped eliminate a great deal of useless dead wood which had been carried for years in the State organizations.

Since the Revolution the American armies had never been called upon to face a great conflict with a foreign power and the only experience of hard fighting with modern weapons had been that of the Civil War.

Several times in recent years serious difficulties have arisen along the Mexican frontier and in 1916 the prospect of war with Mexico seemed so imminent that the President mobilized the National Guard on the Mexican border. No fighting developed but the guard from every State in the Union had the benefit of their first experience in distant service under campaign conditions for many years. The conditions were peculiar.

In 1792 Congress enacted the first militia law which was until 1903 the only law relating to the militia. Having become largely a dead letter Congress in 1903 passed the Dick bill designed to promote the efficiency of the militia. Under this law the National Guard was recognized by the National Government as those organizations in the States whose officers and men had taken the Federal oath provided in the National Defense Act. Until this Federal oath was taken the State forces were known as the organized militia.

The National Defense Act finally became a law on 3 June 1916 and the mobilization of the National Guard was ordered only 15 days later before either the War Department or the State authorities had become sufficiently familiar with its requirements to formulate a clear and practical course of procedure.

The State forces went to the Rio Grande with great enthusiasm but as the months passed and it became evident that there was to be no warlike service for them over the border large numbers of both officers and men demanded their release in order to return to their business and their families. Nothing else in recent years has so clearly illustrated the essential difference between regular and National Guard troops. The regular troops were ready to march out of their various posts wherever they might be and entrain for the border within a few hours after the receipt of telegraphic orders. Once there they were as contented to settle down to the monotony of border patrol duty as they had been to remain in barracks elsewhere. In short they proved to be exactly what the country expected them to be—professional soldiers without any other interest in life than the performance of military duty. At the end of 1916 the War Department issued a book of 169 closely printed pages reciting the history of this mobilization and bearing throughout evidence of the unvarying antipathy of the whole commissioned personnel of the regular army to the National Guard. The burden of the criticisms would have formed an overwhelming indictment of regular troops raised and maintained at government expense in a State of constant readiness for field service. The difficulty lies in the inability of the regular establishment to appreciate the view point of the nation at large. The people of the United States do not expect these State auxiliary forces to be ready at a moment's notice to step out of home and civil occupation and display a degree of readiness for war equal to that of the regulars. They do expect and are increasingly providing the means for them to so far perfect themselves in organization, drill and rifle practice as to be a valuable first auxiliary to the regular army ready after a few months training in the field to face an organized enemy. Back of the National Guard the nation relies upon a great national force of volunteer or draft troops whose organization and training must necessarily require a much longer period. From the view point of the professional soldier it would appear desirable that the nation should consent to his advice and maintain at all times a great standing army. The fact is, however, that no argument from Washington's time down to the present has ever induced any considerable part of our people to agree to this. The settled determination of the country has always remained steadfast in adherence to the scheme of the founders for a small regular army and as large and as efficient a force of State troops as will be supported and recruited by the people of the various States.

There can be little doubt that the experience of the nation in the noted war with Germany will greatly enlarge the vision of the country as to the technical requirements for modern warfare. The value of preliminary training must be generally recognized and it is reasonably certain that State administrations

will be more ready than ever before to co-operate with Federal authorities in plans to harmonize training and equipment as well as organization and paper work methods with regular army standards. The nation will undoubtedly accede to the demand for a larger regular army than has ever before been authorized and the people at large are apt to maintain a closer and more critical interest in the professional efficiency of the army. The time has come for the dual services to really co-operate for the good of the country. The State troops know now how vitally necessary are training and discipline. The regular should know that the country will not permit him to lag behind any foreign service in scientific development. Both have learned how tremendous is the physical strain of modern campaigns and must recognize the necessity for great attention to physical training. It was a disagreeable revelation to the whole nation to discover that a terribly large proportion of our young men were found physically unfit for the army when summoned by the draft. Quite as astonishing was the discovery of illiteracy, for the very rudimentary requirements found more than 24 per cent illiterate and any test which had required the equivalent of a good public school education would have resulted in a much greater disqualification.

It is slow work to build into military efficiency men who are either physically or mentally below the average.

As the United States will always find it necessary to hurry the training of national armies summoned in emergencies it becomes apparent that the boys of the nation ought as a whole to be better developed both physically and mentally before being permitted to leave school. The wisdom of this course would be chiefly apparent in their vastly increased economic value in the business affairs of the nation but it would also be a great asset in the event of a dangerous war which should require our utmost strength.

In recognition of this necessity the State of New York has recently passed a law calling for the compulsory military training of all boys in the State between the ages of 16 and 19. The instruction is devoted largely to the physical development of the boys. Out of 200,000 registered it was found that 85 per cent were already at work leaving only 15 per cent in the schools at 16, 17 or 18 years of age.

In the autumn of 1919 it is still too soon to judge what will be the ultimate effect upon our military system of our participation in the wars and the politics of Europe.

The vast forces raised in 1917 have been brought home and disbanded. The armies of the United States were raised to more than four million men and half of that great total were transported overseas to a battle front where they bore a conspicuous part in the great offensive which in the summer and early autumn of 1918 drove the German armies out of the fortified lines in France which had seemed impregnable for more than three years. The outstanding feature of the American armies was the superb personal courage of the private soldier and the splendid self-sacrificing leadership of the young line officers most of whom had never worn a uniform before 1917. The regular army divisions fought magnificently but were neither braver nor more efficient than the National Guard divisions. The regulars were transported to France very soon after the United States entered the war but it was found necessary to give them a long course of training in the interior before they were capable of entering front line sectors. It was a valuable if humiliating lesson learned by our artillery when they found that our boasted three-inch field piece was utterly useless in modern war. The professional artillerist ought to have known that before hundreds of useless guns of this type were shipped to France in transports where every cubic foot was needed for useful material. The magnificent advance of our infantry in September and October 1918 was made possible because the French army furnished our artillery service with their incomparable "soixante-quinze" capable of laying down a rolling barrage in front of advancing troops which would have been absolutely impossible for our own corresponding gun.

Likewise were our armies indebted for areoplanes to their allies both French and English.

It was unfortunate that difficulties of language led our staff at first to arrange for the instruction of our officers in France by British rather than French corps of instructors. The British had fought magnificently for four years but they had not solved the problem of trench warfare and the errors of their system brought the cause of the allies to the verge of disaster in the spring of 1918. After General Foch assumed the supreme command and the tide of defeat turned into victory the superiority of the French method was generally acknowledged. The American commander, General Pershing, co-ordinated his plans with the French when the American armies entered the great offensive and every detail worked splendidly.

In France the general headquarters of the American armies was located at Chaumont while the subordinate headquarters of the services of administration and supply were at Blois and Tours. The ports used in the enormous transport of troops and supplies were Brest, Sainte Nazaire, La Pallice and Bordeaux. A large number of American troops were landed in England and thence transported to France. So vast were the preparations in France that the arrangements were found in every way adequate for the handling of the 2,000,000 soldiers and their supplies. The arrangements at the ports and along the railway lines included every facility for handling and caring for a still larger force if the war had continued into 1919 as was generally anticipated.

The modern requirements called for air, chemical, gas and many other new services which had to be created in our army. All were thoroughly organized and functioning in the final campaign but in the course of another year would have been capable of great development. The army medical service had an extraordinarily healthy army to deal with but there were a vast number of wounded to be cared for and it was noticeable that the time had not sufficed to standardize this service. Hospitals were excellent, good or fair according to the individual merit of the local commanding officer. The American armies were the best paid and best fed armies in the war. They proved of the very highest fighting value due to the

superb morale of the rank and file. They went to Europe determined to win or die in the attempt. The survivors came back, were mustered out and have returned to civil pursuits with a zest that echoes their oft-expressed desire to "get it over with." A magnificent victory in the greatest of all wars has failed to alter in the slightest degree the national sentiment toward military affairs in general and wars in particular. The regular army will doubtless be somewhat larger and undoubtedly both it and the National Guard will show marked improvement in professional attainments. The nation at large will continue to believe in the invincible courage of all its sons and the continued presence of a providence which bequeaths victories. An important task confronting the army will be the reconciling of that attitude to the necessity that the nation shall provide in peace for the scientific preparation against war which is likely to be the surest insurance against future disaster.

The American Expeditionary Force or A.E.F. as it was called developed in France a well-organized general staff, an essential feature of army economy and efficiency.

General John J. Pershing the commander-in-chief of the American Expeditionary Forces promptly recognized the necessity for a general staff and as the American army had heretofore been destitute of this important department he proceeded to organize one based upon the war experience of the veteran French and British armies. The responsibilities of the general staff were divided into five groups each with a chief functioning as an assistant to the chief of the general staff:

Group 1. Organization and Equipment of Troops.
Group 2. Censorship, Enemy Intelligence, Information, Preparation of Maps, etc.
Group 3. Strategic Plans, Movement of Troops, Supervision of Combat Operations.
Group 4. Co-ordination of Supply, Construction, Transport for Combat, Hospitalization and Evacuation of Sick and Wounded.
Group 5. Schools and Co-ordination of Education and Training.

The first units of the expeditionary army reached France in June 1917.

The combatant forces were organized into divisions consisting of four regiments of infantry of 3,000 men with three battalions to the regiment and four companies of 250 men each to a battalion, and an artillery brigade of three regiments, a machine gun battalion, an engineer regiment, a trench-mortar battery, a signal battalion, wagon trains, headquarters staff and military police. The above with medical and other units gave a total divisional strength of over 28,000 men, about double the size of a French or German division.

Each corps was to consist of six divisions (four combat, one depot, one replacement) with two regiments of cavalry.

Each army was to have from three to five corps.

A great system of army schools was organized in France with headquarters at Langres where the principles of general staff work were taught, and men who had shown qualities for leadership were fitted for commissions.

A school of the line taught young officers leadership requirements and the use of different weapons, including the various types of hand grenades, trench mortars, etc., peculiar to trench warfare.

The artillery school was at Saumur. The aviation school at Issoudun.

The departments of the adjutant-general, inspector-general and judge-advocate-general remained with the general headquarters at Chaumont.

The administrative and supply services were transferred to the headquarters of the Service of Supply (the S. O. S.) at Tours and included the chief quartermaster, chief surgeon, chief signal officer, chief of ordnance, chief of air service, chief of chemical warfare, general purchasing agent, provost-marshal-general, director-general of transportation and chief engineer. The chiefs of all these branches of the service were subordinate to the commanding general of the service of supply, who was assisted by a large staff charged with the administrative co-operation of the various departments.

Great storage depots were built at La Pallice, Montoire and Gievres. Hospitals and barracks were constructed at many places in France. Enormous additions were built at the ports and on the lines of railway communications. The forestry service cut an immense amount of timber required by the engineer corps.

The American Expeditionary Forces engaged in the heavy fighting of 1918 were indebted to the French entirely for the light artillery which made the advance of our infantry possible. Although American manufacturers had started to make the required modern artillery, not one such weapon was in service at the front up to the time the armistice was signed. The French army furnished for our aviation service 2,676 aeroplanes of pursuit, observation and bombing types. After May 1918 1,379 planes arrived in France from the United States.

While our forces were never sufficiently supplied with tanks we were indebted for all we had to the French.

In order that the moral welfare and the physical comfort of the millions of young American soldiers serving in a foreign country should be cared for as fully as possible the American commander gave every possible assistance and encouragement to the Young Men's Christian Association, Knights of Columbus, Salvation Army and Jewish Welfare Board. The Red Cross ministered to our soldiers with an efficiency and devotion incomparable on every line of communication and in every hospital.

When the great German offensive broke against the Allied front 21 March 1918 it became apparent that unity of command was a first essential if the Allied armies were to avert disaster, and General Pershing by direction of the President immediately placed all of his forces (343,000 men) at the disposal of Marshal Foch.

When the United States entered the European War our army numbered 190,000 (6 April 1917) and when the armistice was signed (11 Nov. 1918) the numbers had increased to 3,665,000, of whom somewhat more than 2,000,000 were in France.

Civilian employees of the War Department increased from 2,000 to 25,000. For the year ending 30 June 1918 the appropriations for the support of the military establishment aggregated $8,000,000,000. For the year ending 30 June 1919 the appropriations for same aggre-

gated $15,300,000,000. The American casualties were in excess of 292,000.

Killed in action, 34,593; died of wounds, 13,958; died of disease, 23,669; died from accident and other causes, 5,308; wounded, 214,515. Of the wounded 85 per cent returned to duty.

In the Civil War the fatalities on the Union side were approximately 110,000. In the Spanish War we had less than 1,000 men killed in battle.

With a view to imposing the burdens of this war upon the present generation, rather than upon their descendants, Congress created the War Risk Insurance against death or disability. The premiums were payable monthly by deduction from the month's pay and were graduated according to age, averaging 80 to 90 cents per thousand per month.

On 18 May 1917 Congress passed the First Selective Service (Draft) Law, which with subsequent amendments resulted in four registrations.

5 June 1917 — 21 to 30 years	9,586,508
5 June 1918 — 21 to 30 years	744,865
24 Aug. 1918 — 21 to 30 years	158,054
12 Sept. 1918 — 18 to 20 and 32 to 45	12,966,594
Total	23,456,021

The drafted men showed a very large proportion of the young manhood of the nation to be physically unfit for military service, and very nearly 25 per cent were shown by the most elementary tests to be illiterate. Thousands, foreign-born entered the service unable to speak or read English and occasioned a new problem in face of the necessity to quickly convert them into soldiers competent to serve in an American army.

A series of Officers' Training Camps supplied much of the demand for officers. From these training camps commissions were granted to two colonels, one lieutenant-colonel, 294 majors, 5,429 captains, 12,374 first lieutenants and 39,207 second lieutenants, a total of 57,307 officers provided by these schools of intensive training. It was an axiom with units serving in front-line sectors that "Lieutenants are expendible" due to heavy casualties among line officers exposed to the hardships and dangers of trench warfare, and there was constant need for first and second lieutenants to replace officers invalided to the rear, sick, wounded or killed.

Statistics of the Army of the United States.— There are no reliable figures as to the strength of bodies of militia maintained more or less irregularly in the colonies before the Revolution. Franklin organized a volunteer military association for the defense of the province of Pennsylvania in 1744. In 1755 he was colonel of a regiment and built forts for the defense of the frontier. There were irregular bodies of militia in the southern colonies and more thoroughly organized units among the New England colonies, particularly Massachusetts and Connecticut.

The following shows the number of troops furnished by each State for the Continental Army during the Revolution:

New Hampshire	12,947
Massachusetts	67,907
Rhode Island	5,908
Connecticut	31,939
New York	17,781
New Jersey	10,726
Pennsylvania	25,678
Delaware	2,386
Maryland	13,912
Virginia	26,678
North Carolina	7,263
South Carolina	6,417
Georgia	2,679
Total in Federal service	231,771
Militia and volunteers	164,087

The British forces in America during the period of this war numbered about 150,000.

The cost of the war to the United States was $350,000,000 and the resulting pensions amounted to $70,000,000. The cost per capita was $123.

TROOPS EMPLOYED DURING THE WAR WITH TRIPOLI, 1801.

Regulars	3,330

TROOPS EMPLOYED DURING THE WAR OF 1812.

Regulars (including 5,000 sailors and marines)	56,032
Volunteers	10,110
Rangers	3,049
Militia	458,463
	527,654

British forces opposed did not exceed 67,000. This war cost the United States $86,627,000. Resulting pensions have amounted to $46,000,000

CREEK INDIAN WAR.

Regulars	600
Militia	43,921
	44,521

SEMINOLE INDIAN WAR (1817).

Regulars	1,000
Volunteers	5,911
	6,911

Indians opposed, about 1,000.

BLACK HAWK INDIAN WAR (1832).

Regulars	1,341
Volunteers	4,638
	5,979

Indians opposed about 900.

FLORIDA INDIAN WAR (1835–1842).

Regulars	12,539
Volunteers and militia	48,152
	60,691

The war expenditures during this prolonged conflict with Florida Indians amounted to $69,751,611.50, although the opposing warriors numbered less than 2,000.

Indian war pensions (including service pension) have cost the government $14,204,296.51.

MEXICAN WAR (1846–48).

Regulars	31,024
Volunteers and rangers	60,659
Militia	12,601
	104,284

The maximum strength of the Mexican troops did not exceed 46,000.

The cost of the war to the United States was $88,500,208.38 and the resulting pensions amounted to somewhat more than $51,000,000.

CIVIL WAR (1861–65).

Regulars	67,000
Volunteers and militia	2,606,341

The cost to the United States was $5,371,079,778.28 with resulting pensions which will be in the neighborhood of another $5,000,000,000.

The strength of the Confederates probably

was not greatly in excess of 1,000,000 men with less than 700,000 as a maximum of effective combatants available at any one time.

The cost of the Civil War per capita is estimated at $96.

Spanish War (1898).

Regulars	58,688
Volunteers and militia	223,235

The cost was $321,833,254.76 and the pensions during the following 20 years have amounted to more than $57,000,000.

Opponents numbered about 228,160 men.

Philippine War (1898–1900).

Regulars	76,416
Volunteers	50,052

The cost was $170,326,586.11. Pension cost estimates included with Spanish War figures.

Peking Relief Expedition.

Regulars	2,100

Comparative Strength of Service March 1917 and November 1918.

Branch	Old army Mar. 1917	New army Nov. 1918
Infantry and machine gun	85,000	974,000
Engineer	3,000	394,000
Field Arty. and Amm. Tr.	9,000	389,000
Medical	7,000	300,000
Quartermaster	8,000	228,000
Coast Artillery	21,000	137,000
Ordnance	1,000	64,000
Signal	3,000	52,000
Cavalry	22,000	29,000
Air Service	None	202,000
Motor Transport	None	103,000
Militia Bureau	None	27,000
Chemical Warfare	None	18,000
Tank	None	14,000
In Training	.....	549,000
All other	31,000	185,000
	190,000	3,665,000

Important Military Operations.

1775–1783 War with England
1790–95 War with Northwestern Indians
1794 Whisky Insurrection in Pennsylvania
1801–05 War with Tripoli
1806 Sabine Expedition in Louisiana
1811–13 War with Western Indians
1812 Seminole Indian War in Florida
1812–15 War with England
1813–14 Creek Indian War in Alabama
1836–39 Cherokee Indian War
1836 Aroostook Disturbance
1838–39 New York–Canada Frontier Disturbance
1846–48 War with Mexico
1848 Cayuse Indian War in Oregon
1849–61 Navajo Indian War in New Mexico
1849–61 Indian Disturbances in Texas
1850 Pitt River Expedition in California
1851–52 YumaExpedition in California
1851–56 Indian Wars with Snake, Sioux, Yakima, Cheyenne and Arapahoe Tribes
1855–57 Seminole Indian War in Florida
1857 Gila Expedition in New Mexico
1857–58 Mormon Expedition in Utah
1858 Indian troubles in Puget Sound Region
1858–59 Indian troubles at Wichita, Ind. Ter., Colorado River, Cal., Pecos and Antelope Hills, Tex., and Bear River, Utah
1859–60 Coartina troubles in Texas and Mexico
1860 Indian campaigns against the Kiowa-Comanches in Indian Territory, and Carson Valley, Utah
1860–61 Navajo Campaign in New Mexico
1861–66 Apache Indian War in Arizona and New Mexico
1861–65 Civil War
1862–67 Sioux Indian War in Minnesota and Dakota
1863–69 Indian Wars in Kansas, Nebraska, Colorado and Indian Territory.
1865–68 Indian War in the Northwest
1865–66 Fenian disturbances New York–Canadian border
1867–81 Indian Campaigns in West and Southwest and disturbances along Mexican border.
1868–69 Canadian River Expedition in New Mexico
1871 Yellowstone Expedition
1872–73 Modoc Indian War in California
1873 Yellowstone Expedition, Dakota
1874–75 Indian Campaigns in Indian Territory, Wyoming, Nebraska and Dakota
1875 Indian Campaign in Nevada
1876 Powder River Expedition in Wyoming
1876–77 Indian Campaigns on the Big Horn and in Yellowstone — Wyoming and Montana
1876–79 Indian Wars in the Northwest with Sioux and Cheyenne Tribes
1877 Labor Disturbances in Pennsylvania and Maryland
1877 Campaign against Nez Perces Indians
1878 Campaign against Bannock and Piute Tribes in Nevada and Idaho, and Utes in Colorado
1879–84 Campaigns against Indians in Oklahoma, Colorado and Utah
1885 Chinese Labor troubles in Wyoming
1890–91 Sioux Indian Campaign in South Dakota
1891–93 Garcia Disturbances on Texas-Mexico frontier
1892 Labor Troubles at Mines of Idaho
1894 Labor Troubles, Illinois and on Pacific Coast
1895 Bannock Indians Disturbance
1898 War with Spain
1899–1902 War in the Philippines
1900–01 Peking Relief Expedition in China
1912–13 Nicaraguan Expedition
1913–14 Expeditions to Haiti and Santo Domingo
1914 Labor Disturbances in Colorado
1914 Vera Cruz Expedition
1915 Punitive Expedition into Mexico
1917–1918 European War
1919 Race Riots and Labor Strikes in United States
1919 Campaigns in Siberia and northern Russia against Bolsheviki armies

Relative Strength of the Army to the Population.

	Officers and men	Per cent
1790	1,273	3/100 of 1
1800	4,436	8/100 of 1
1810	9,921	14/100 of 1
1820	8,942	9/100 of 1
1830	5,951	5/100 of 1
1840	10,570	6/100 of 1
1850	10,763	5/100 of 1
1860	13,367	5/100 of 1
1870	37,075	10/100 of 1
1880	26,509	5/100 of 1
1890	27,089	4/100 of 1
1900	67,500	9/100 of 1
1910	77,035	8/100 of 1
1918	3,665,000	3½

The strength of the army on 1 Nov. 1919 was 274,787, not including nurses and field clerks. Of this number 21,445 were in Europe, 9,967 en route to or from Europe and 209,227 in the United States.

Generals Commanding the Army of the United States.

George Washington[1]	1775–1783
Henry Knox[1]	1783–1784
Josiah Harmar[2]	1788–1791
Arthur St. Clair[1]	1791–1796
James Wilkinson[1]	1796–1798
George Washington[3]	1798–1799
James Wilkinson[4]	1800–1812
Henry Dearborn[1]	1812–1815
Jacob Brown[1]	1815–1828
Alexander Macomb[1]	1828–1841
Winfield Scott[1]	1841–1861
George B. McClellan[1]	1861–1862
Henry W. Halleck[1]	1862–1864
Ulysses S. Grant[3]	1864–1869
William T. Sherman[3]	1869–1883
Philip H. Sheridan[3]	1883–1888
John M. Schofield[5]	1888–1895
Nelson A. Miles[5]	1895–1903
S. B. M. Young[5]	1903–1904

[1]Major General.
[2]Lieutenant Colonel with the brevet rank of Brigadier General.
[3]General.
[4]Brigadier General.
[5]Lieutenant General.

GENERALS COMMANDING THE ARMY OF THE UNITED STATES — *Concluded.*

Adna R. Chaffee[1]	1904–1906
Arthur Mac Arthur[1]	1906–1909
Leonard Wood[2]	1909–1917
Hugh L. Scott,[3] Chief of Staff	1917
John J. Pershing,[2] Gen. Staff, C. O., A. E. F.	1917
Peyton C. March,[3] Chief of Staff	1918

FROM 1791 TO 1904, THE COST OF THE MILITARY ESTABLISHMENT.

1791–1811	Peace	$5,669,930 65
1812–1816	Including war with England.	82,627,009 14
1817–1835	Various Indian Wars	90,411,068 59
1836–1843	Florida War	69,751,611 11
1843–1845	Peace	13,873,146 89
1846–1849	Including Mexican War	88,500,208 38
1850–1860	Peace	168,079,707 57
1861–1865	Civil War	2,736,570,923 50
1866–1869	Peace	583,749,510 99
1870–1897	Peace	1,211,321,300 94
1898–1899	Including Spanish War	321,833,254 76
1900–1902	Including Philippine War	391,662,681 06
1902–1904	Peace	1,693,920,509 96
	Total 1790–1904	$7,457,970,863 54
	Pensions 1790–1904	4,729,957,370 94

A circular issued by the War Department on 26 Sept. 1919 announced an important new policy in the training to be given enlisted men. Hereafter, in addition to military drill, recruits are to be given such educational and vocational training as will improve their effectiveness, not only for service in the army, but for success in civil life as well. Congress appropriated $2,000,000 for vocational training for the fiscal year ending 30 June 1920 and a Recruit Educational Centre was established at Camp Upton, Long Island, N. Y. In November 1919, 800 recruits were under instruction at this school and the detachment included representatives of 43 nationalities; not only was English being taught to the foreign born, but some native born Americans were receiving their first school training. In addition to schoolroom lessons trades were being taught in model machine shops, covering a wide variety of useful occupations, which should guarantee to all these men profitable civil employment at the end of the army enlistment. Interesting profitable employment thus takes the place of what were formerly long irksome periods of idleness, doubtless responsible for much of the desertion which in peace time was a great evil. See ARMY; ARMY ADMINISTRATION; ARMY COMMISSARY; ARMY MEDICAL SCHOOL; ARMY AND NAVY MANŒUVRES; ARMY ORGANIZATION; ARMY REGULATION; ARMY RESERVE; ARMY SCHOOLS; ARMY STAFFS; ARMY TRANSPORT SERVICE; ARMY TRANSPORTATION; WAR, EUROPEAN — WESTERN CAMPAIGNS.

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EDWIN W. DAYTON,
Major, Infantry, R. L.

[1] Lieutenant General. [2] Major General. [3] General.

56. NAVY OF THE UNITED STATES. The American navy came into existence in 1775 after the close investment of Boston by Washington had cut off all supplies to the British troops, save such as might arrive by water. To intercept these, some small vessels were armed and manned by New England seamen, first under the auspices of Rhode Island and Connecticut, and afterward by authority of the Congress which organized a Naval Committee with John Adams at its head. These little craft not only deprived the enemy of succor, but captured enough prizes to furnish the colonial army with war material, without which it could not have continued hostilities.

Early History.— In 1776 the navy had 31 cruisers mounting 586 guns, and no less than 136 privateers mounting 1,360 guns had also been fitted out. Including the flotilla on Lake Champlain, the government war vessels in service during the Revolution numbered in all 64, carrying a total of 1,242 guns. This force captured 196 vessels worth about $6,000,000, and the privateer auxiliaries, numbering 792, mounting over 13,000 guns, took 600 British ships, valued at $18,000,000. Insurance on British bottoms rose from 2 to 15 per cent. This unprecedented destruction was one of the strongest arguments which led to peace.

The *Hancock, Randolph, Raleigh* and other cruisers authorized by Congress were excellent ships, and the *Alliance* and *Confederacy* built toward the close of the war had no superiors afloat. They were mainly armed with 4- to 18-pounder guns. Progress, however, stopped when independence was achieved, and the vessels were sold and men discharged. In 1794 a law re-establishing the navy under the Secretary of War was enacted and six frigates authorized. Of these, three were constructed, the *Constitution*, 44 guns, 1,576 tons; *Constellation*, 36 guns, 1,265 tons; and *United States*, 44 guns, 1,576 tons. The *Constitution* is still afloat. Three were abandoned and the material sold. Under the pressure of French spoliations, however, the navy was increased and at the beginning of the quasi-war with France in 1798 it aggregated 22 ships with 456 guns and 3,484 men. This little force during the two and a half years of hostilities captured 84 French armed vessels mounting over 500 guns. The military discipline of the navy here begins: the American officers, largely recruited from merchantmen, learned from the commanders of the British war vessels in the West Indies the traditions and customs of the older service. Then also came in the carronade or short gun, with little penetrating but great smashing power. At the end of the French War, another reduction of the navy took place. The theory that ships and guns could be called into existence when needed,

as easily as log cabins, even at that early day, had become well rooted. Accordingly after cutting our force down to 15 vessels, we deemed it wise to present the Dey of Algiers with 26 barrels of silver dollars and the fine frigate *Crescent* to induce him to let our commerce alone. Tripoli in her turn, being thus encouraged, demanded special blackmail. Thereupon the navy, once more rejuvenated, not merely destroyed the Barbary pirates, but emerged from the war in 1805 a sea power hereafter to be taken into account in the world's diplomacy. It was during these campaigns that disciplinary routine was so highly perfected by Commodore Edward Preble that it has remained with little substantial alteration to the present day. It was then also for the first time that the American navy was accorded all the formal honors of a national service by the war-ships of other countries.

War of 1812.— When the War of 1812 with Great Britain began, the navy had 17 ships aggregating 15,300 tons and carrying 442 guns and 5,025 men. It had no yards, no docks, no adequate means of any sort for repair or refitting. The British navy, fresh from the victories of Trafalgar and the Nile, had over seven times this force on the North American station alone. Within seven months the United States ships had reduced three British frigates to wrecks and taken 500 merchantmen — a result which astounded the world. The *Constitution,* 55 guns, destroyed the *Guerrière* in 40 minutes and the *Java* in one hour and 55 minutes, and the *United States,* 54 guns, dismantled the *Macedonian, 29,* in about an hour and a half. The subsequent sloop actions were almost equally decisive. The noteworthy fact of these duels was the destructive character of the American fire — which literally tore the British ships to pieces and converted their decks into slaughter-houses. Three prominent factors contributed to success.

1. The United States ships, and especially the frigates, were larger — 12 feet longer — and at the same time more easily manœuvred than any which had ever before been built. The sloops-of-war outclassed those of foreign navies at every point.

2. The frigates concentrated the power of a ship of the line. They mounted long 24-pounders in broadside — an innovation startling for the times. To the *Guerrière's* 32 long 18's and 16 short 32's the *Constitution* opposed 30 long 24's and 24 short 32's. When she fought the *Java* she had increased the number of her long 24's to 32, so that while decreasing the number of her short guns to 22, she had augmented their size to 24-pounders. That gave the combination of low power, heavy smashing projectiles with relatively high power penetrating projectiles which characterized the navy armament for many a year afterward.

3. The American gunners aimed their guns. They had been taught, as their fathers from the backwoods, who had harried the Hessians had been taught, to fire at targets; to use their long cannon as they used their long fowling pieces and to send round shot into hulls at the water line, just as they were accustomed with their rifle bullets to bring down ducks on the wing. The British system then involved no gun pointing. The carronades had no sights and were laid level — point blank — with a range of about 500 yards. They were fired with the same hope of hitting something which King George's grenadiers or those of his serene Highness of Waldeck cherished when they presented fire-lock and pulled the trigger in one motion. So long as shot cut up sails and rigging and so impaired motive power the desired end was attained. The bull-dog Briton could then lay his ship close aboard the enemy and finish the fight with boarders and cutlasses. But the handy American ships kept out of point blank range. Their long 24's enabled them to do this and at the same time deliberately to drill holes in the British water line, while occasionally anticipating the yet distant shell fire by sending slow heavy balls against the wooden sides and annihilating whole gun's crews with the resulting shower of splinters. That is how the *Wasp* cut up the *Frolic* in 43 minutes and the *Hornet* demolished the *Peacock* in just 11 — while incidentally demonstrating the superior advantages of firing on the down roll of the ship in order to convert the adversary into a sieve, instead of on the up roll which merely clipped his wings.

In the War of 1812 the regular navy numbering but 23 vessels carrying in all but 556 guns captured 254 of the enemy's craft. The value of the prizes taken by the navy and the privateers jointly was over $45,000,000. The cost of British marine insurance became almost prohibitive; 13 guineas per £100 was paid to insure vessels crossing the Irish Channel. So great was the injury to British commerce that in June 1813 flour in Great Britain was $58 per barrel and lumber $72 per 1,000 feet. Before the war was over the English were building ships on the "exact lines" of the American 44-gun frigates and cutting down some of their most famous line-of-battle ships to compete with them. After peace had been secured, the permanent establishment of the navy was fixed at 12 ships of the line, 14 first class frigates, three second class frigates, six sloops-of-war and a proportionate number of smaller vessels. The more famous craft built between 1814 and 1825 were the 74-gun ships *Washington, Franklin, Columbus, Ohio* and *Delaware,* which were armed with 12 eight-inch and 70 32-pounder guns. For a time the *North Carolina* with 102 guns in three tiers of port-holes on her towering sides was regarded as the most powerful war-ship afloat. Meanwhile the possibilities of steam war vessels were looming up. Robert Fulton had built the *Demologos* in 1813, which not only was propelled by a midships paddle wheel — but had a queer collection of innovations, notably a battery of long 32-pounders supplemented by a 100-pounder submarine gun and apparatus for discharging steam into an enemy's hull. She was accidentally blown up in 1829 and was succeeded by the wooden steam battery *Fulton the Second,* built in 1837 which, however, proved a failure. Four years later the *Mississippi* and *Missouri,* side wheel steamers, were constructed and they were followed in 1847 by the *Susquehanna* and *Powhatan* — all excellent and serviceable vessels. The value of having the motive power beneath the water line had, however, already attracted attention to the screw propeller. In 1844 the *Princeton,* designed by Capt. John Ericsson, the first screw steam war vessel ever built, was launched. She carried two long 225-pounder built-up guns, capable of piercing four and one-half inches of wrought

iron, and the first of their type. She was broken up in 1849 — but was in service long enough fully to demonstrate the naval importance of screw propulsion. The engineer corps of the navy (amalgamated with the line in 1899) was organized by Act of 31 Aug. 1842 and in 1845 the United States Naval Academy (q.v.) was established at Annapolis.

The Civil War.— The screw steam war vessel was now fully developed and those of our navy were as graceful as yachts and the most formidable of their class. Between 1856 and 1859 we built the *Niagara, Colorado, Merrimac, Wabash, Minnesota* and *Roanoke,* frigates, and the *Brooklyn, Lancaster, Hartford, Richmond, Pensacola, Pawnee, Michigan, Narragansett, Dacotah, Iroquois, Wyoming* and *Seminole,* sloops. Meanwhile the Dahlgren shell gun began to replace the older type of smooth bore. When the Civil War broke out the navy, however, had become much reduced. Of the 90 vessels on the list, 42 were in commission and the rest unserviceable. The sailing ships still carried the ancient 32-pounders and eight-inch shell guns and only the steamers were provided with Dahlgrens — but these were regarded as monsters, their calibre having increased to 11 inches. It went to 15 and even 20 inches before the war closed — but the guns were very short, powder charges small and initial velocities seldom rose above 1,200 feet per second. These pounding weapons — true to the old principle — were supplemented by rifles mainly of the Parrott type, which lingered long after they had been proved about as dangerous to friend as to foe. When the war opened, the navy had 1,457 officers and 7,600 seamen — when it closed the officers numbered 7,500 and the seamen 51,500 — 208 additional vessels were built and 418 purchased. The total number of Confederate or British vessels captured or destroyed was 1,504, valued at $31,000,000; and the net proceeds of property seized on the blockade which was efficiently maintained over more than 3,000 miles of coast was $20,501,927. The cost of the navy throughout the Civil War was about $314,000,000, equal to only 9.3 per cent of the government expenditure for the whole period of four years and four months. The total number of ships of all classes in the navy in December 1864 was 671.

The great naval development of the Civil War was the *Monitor,* a raft-like vessel 172 feet long over all, of 41½ feet beam and 11½ feet depth, of hold plated with five layers of one inch iron on her hull and eight layers on her single steam rotated turret wherein were installed two 11-inch Dahlgren guns. She revolutionized marine warfare and made the wooden steam frigate about as archaic as the Roman trireme. To a limited extent also (especially in the Confederate ironclads *Virginia* and *Tennessee* and the Federal so-called "tin-clads" of the Mississippi) the armored casemate was subjected to test — but it is only of comparatively late years and following the great improvements in armor that the casemate has assumed a really important place in naval construction.

Reorganization.— After the Civil War, the navy as usual was rapidly reduced — the total number of vessels in commission in the fall of 1866 being but 115. The monitors were laid up at League Island and gradually destroyed. Five which survived, though practically useless, were permitted a brief harbor service during the Spanish War. Two, however, of the more formidable class, the *Miantonomah* and the *Monadnock,* made long voyages respectively to Europe and around Cape Horn — thus for the first time demonstrating the sea-going capacity of low freeboard turret ships and dooming to final extinction the wooden man-of-war. Gradually but steadily the depletion of the navy list continued and vessel after vessel was sold. Many were broken up under the law decreeing destruction if needed repairs should be found to cost more than 20 per cent of the value — and finally in 1881, so far as ships went, the country was little better than defenseless. In July of that year we had, as the steam navy, 13 so-called first rates (all of wood of from 2,840 to 3,173 tons measurement) of which one, the *Tennessee,* was at sea and four were ancient craft still on the stocks and never launched; 20 second rates (929 to 2,300 tons, all wooden but one) and most of these old-fashioned and unserviceable; 27 third rates (410 to 918 tons), again all wooden but four, and some of the Civil War monitors. The rest of the navy was made up of wooden sailing ships, two of which had served in the War of 1812, including some that became all but worn out decades earlier while chasing pirates in the West Indies and slavers on the African coast. The one sea-going flagship *Tennessee* (plus "repairs") in 10 years of active service gradually cost $3,800,000 and was ultimately sold for $34,555. Numerous other vessels built in the interval since the Civil War had meanwhile gone almost immediately from shipyard to scrap heap. "It is often the subject of wonder," says the Secretary of the Navy in his report for 1887, "what has become of the $70,000,000 spent upon war vessels since the close of the war in view of the fact that there is now no navy." The existing armament was as antiquated as the ships themselves. It consisted principally of nine-inch smooth bore and eight-inch rifle guns, all muzzle loading, and the latter had been economically concocted from old 11-inch Dahlgrens by inserting a wrought iron rifled tube in the bore. The only breech loaders in the service were those which had been "converted" from the miserable 100 and 60-pounder Parrott rifles. This deterioration of the navy, however, extended no further than to the ships, and, at times, to the Navy Department. Throughout all that long period of corruption and decay the discipline of the service never wavered, the attainments of the naval officers constantly advanced, drills and target practice were as scrupulously maintained on wretched wooden craft which the poorest foreign ironclad could send to the bottom with ease, as if they had been held on the most powerful of battleships, and although we had, at most, only 55 antiquated ships, every one of them too slow to run away from and too weak to fight with a war vessel of the modern build and equipment, none the less all were ready to do their best — inadequate as it was — instantly and at all times. The ships of the United States navy have often become weak in numbers and bad in construction, but the men who handle them have never retrograded. In quality the personnel of the United States navy has always been the best.

It was in 1881 that Secretary Hunt appointed an advisory board to determine the requirements of a new navy. It recommended 21 armored vessels besides 70 unarmored, together with rams, and most significant of all declared that the material of construction should be steel. That was the knell of the iron navy — although as a matter of fact, iron had never fully replaced wood. Meanwhile there was not a plant in the United States capable of making forgings for guns of more than six-inch calibre — nor one able to make armor plate or torpedoes or machine guns. In May 1887 contracts were signed with the Bethlehem Iron Company for gun forgings and armor plates and in the same year the now great naval gun factory in the Washington navy yard was begun.

The Modern Navy. — The first vessels of the new steel fleet were the *Dolphin* (1884) and the *Atlanta, Boston* and *Chicago* (1885). The increase after 1888 was rapid, the outbreak of the Spanish War of 1898 finding the navy equipped with 77 vessels, including several coast line battleships such as the *Iowa, Indiana* and *Oregon* and the powerful armored cruisers *New York* and *Brooklyn*. The war developed the remarkable preparedness of the navy, which practically annihilated that of Spain in a campaign of 110 days. The chief naval event apart from the battles of Santiago and Manila was the famous rush of the *Oregon* from San Francisco to Jupiter Inlet, Fla., around Cape Horn, a distance of some 14,000 miles in 68 days, which she accomplished without accident, arriving in condition for immediate service.

The history of the United States navy from the close of the war with Spain to the advent of vessels of the Dreadnought type demands but little attention. Vessels were laid down on no large scale, but those built were among the best of their type. The battleships of this period (1899–1906) were of from 12,500 to 16,000 tons displacement and about 450 feet in length. The speediest vessels of this type and period — *Georgia* and *Kansas* classes — steamed 19 knots per hour. The armored cruisers had an average speed of 22 knots per hour. An unprecedented event in America's naval history and one of the most spectacular of cruises was the sailing of the United States battleship fleet around the world; it departed from the Atlantic Coast 16 Dec. 1907 and returning without mishap on 20 Feb. 1909. When the fleet sailed, Admiral Evans, in command, declared that it was ready "for a fight or a frolic." It proved to be the latter, and while the proposition to take the trip was vehemently opposed when first broached, it was so successful in its results that those who felt most disgruntled could, after the return, find no more cogent reason for even a lukewarm opposition than the expense attending the excursion.

An enlarged building program was inaugurated after 1906, and when war was declared on Germany in April 1917 the tonnage of the United States navy, including all types of vessels then under naval control, was approximately 1,500,000. Strained relations with Germany caused the United States to enter upon a course of great naval expansion in 1916–17, which led to a considerable increase in expenditure, due mainly to the adoption for the first time of a continuous shipbuilding program. The period was of three years, the total cost to be approximately $520,000,000, and in the first year four battleships, four battle-cruisers, four scout cruisers, 30 submarines and 20 destroyers were laid down, to be followed by six additional battleships, two battle-cruisers and a number of smaller vessels. With the declaration of war the program was enormously increased and accelerated; at the opening of hostilities the navy had 787 vessels of all kinds, including a large number of submarine chasers. The sum of $350,000,000 was at once appropriated for destroyers. The Secretary of the Navy on 9 Dec. 1917, in his annual report, asked for $1,000,000,000 for his department for the next fiscal year. The personnel of the navy was at the same time increased from 19,500 to 322,000; the naval reserves from a few hundred to 49,000; the monthly expenditure from $8,000,000 to $60,000,000, and ships in commission from 300 to over 1,000. The splendid work of the naval arm in the Great War is treated elsewhere. (See WAR, EUROPEAN — NAVAL OPERATIONS). In 1919 a new three-year building program was laid before Congress. It called for 10 battleships, six battle-cruisers, 10 scout-cruisers and 130 destroyers, submarines, etc.

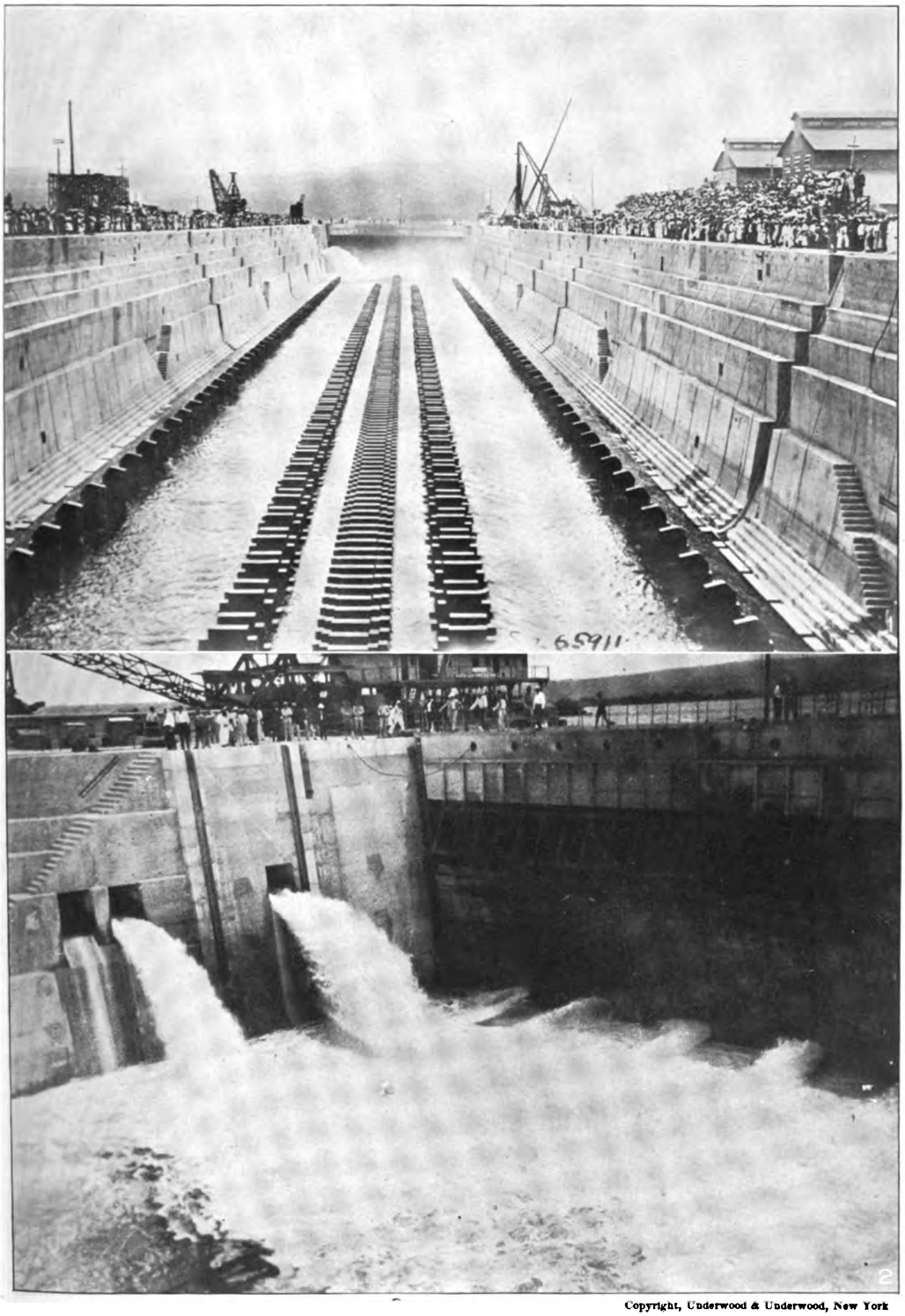
At the close of the European War the navy had increased into a fighting organization of more than 2,400,000 tons, or, if transports under naval control are added, of well over 3,000,000 tons.

In 1917 and 1918 three superdreadnoughts, the largest afloat, were added; more than 100 destroyers were built; two superdreadnoughts to be armed with 16-inch guns were completed in 1919, while five great battle-cruisers and a fleet of fast scout cruisers were being constructed. In 1919 also was inaugurated the policy of expanding the navy into two great fleets, one in the Atlantic and the other in the Pacific. Each fleet contains two divisions of dreadnoughts, with two divisions of predreadnoughts held in reserve in each ocean, about 100 destroyers. These fleets are brought together each year for joint battle exercises under a single command. The Panama Canal makes possible the holding of joint manœuvres whenever they are necessary. Many of the newer type of dreadnoughts and other vessels are oil-burners. The new ships under construction are all of the oil-burning type.

The dreadnoughts now number 23 and of these 17 are in commission and two are nearing completion. In the following table are given the names and tonnage of the dreadnoughts of the American navy:

VESSEL	Tons	VESSEL	Tons
Arizona	31,400	North Dakota	20,000
Arkansas	26,000	Oklahoma	27,500
California	32,300	Pennsylvania	31,400
Colorado	32,600	South Carolina	16,000
Delaware	20,000	Tennessee	32,300
Florida	21,825	Texas	27,000
Idaho	32,000	Utah	21,825
Maryland	32,600	Washington	32,600
Michigan	16,000	West Virginia	32,600
Mississippi	32,000	Wyoming	26,000
Nevada	27,500		
New Mexico	32,000	Total tonnage	630,450
New York	27,000		

In 1919 there were begun three 42,000-ton dreadnoughts, each mounting 12 16-inch guns. The *Colorado, Washington* and *West Virginia* were the first American vessels to mount 16-inch



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PEARL HARBOR DRY DOCK, HONOLULU

1 Opening of the water controls 9 Sept. 1919

2 The first flow of water passing into the dock

guns. There is a main battery of eight on each vessel. The *New Mexico, Idaho* and *Mississippi* mount each 12 14-inch rifles. The *California* and *Tennessee* were the last vessels of the first line of the navy to mount guns of the 14-inch type; each vessel carries 12 guns of that calibre. The *Pennsylvania* and *Arizona* each mount 12 14-inch guns; the *New York, Texas, Nevada and Oklahoma* mount each 10 14-inch guns; the *Arkansas* and *Wyoming* 12 12-inch; the *Delaware, Florida, Utah* and *North Dakota* 10 12-inch; and the *Michigan* and *South Carolina* each have eight guns of 12-inch calibre. The oil-burners of the present fleet are the *New Mexico, Mississippi, Idaho, Pennsylvania, Arizona, Nevada* and *Oklahoma*. The old-line battleships which furnish the coast reserve for the new fleets are: *Alabama*, 11,552 tons; *Connecticut*, 16,000 tons; *Georgia*, 14,948; *Illinois*, 11,552 tons; *Indiana*, 10,228; *Iowa*, 11,346 tons; *Kansas*, 16,000 tons; *Kearsarge*, 11,250 tons; *Kentucky*, 11,520 tons; *Louisiana*, 16,000 tons; *Maine*, 12,500 tons; *Massachusetts*, 10,228 tons; *Minnesota*, 16,000 tons; *Missouri*, 12,500 tons; *Nebraska*, 14,948 tons; *New Hampshire*, 16,000 tons; *New Jersey*, 14,948 tons; *Ohio*, 12,500 tons; *Oregon*, 10,288 tons; *Rhode Island*, 14,948 tons; *Vermont*, 16,000 tons; *Virginia*, 14,948 tons; *Wisconsin*, 11,552 tons, making a total tonnage of this type of 309,148.

The tonnage of the navy as it now (1919) stands is as follows:

TYPE	Number	Tons
Dreadnoughts	23	630,450
Old-line battleships	23	309,148
Battle cruisers	6	211,410
Armored cruisers	9	111,900
First-class cruisers	5	36,765
Second-class cruisers	4	25,065
Scout cruisers	.....	60,950
Third-class cruisers	15	47,820
Gunboats	37	36,055
First-class destroyers	192	208,998
Coast destroyers	20	6,275
Torpedo boats	17	3,150
Submarines	148	118,000
Mine sweepers	.....	46,650
Fuel ships	.....	225,929
Tenders	.....	130,560
Hospital ships	.....	37,497
Supply ships	.....	33,900
Tugs	.....	42,807
Transports*	.....	900,000
Special types	.....	92,602
	.....	3,365,931

* Transport tonnage is made up of merchant vessels which in peace time are turned back to private hands subject to call by the naval authorities when an emergency arises.

The battle-cruisers, which like the super-dreadnoughts, carry 16-inch guns, are among the largest and speediest vessels of their type. They are the *Constellation, Constitution, Lexington, Ranger* and *Saratoga*, and one other cruiser; each has a displacement of 35,236 tons, making a total of 211,416 tons for this class. In the late war no vessel played a more important part than the fast-going modern destroyer, the ship that conquered the submarine. America's new fleet of destroyers each bears the name of a naval hero of other days. The average displacement is 1,165 tons for this class of vessel, of which the navy has 192, with a total tonnage of 208,998. There are 15 of the older type of destroyers of 430 tons average displacement, a total of 6,275 tons. There are 17 torpedo boats of from 142 to 280 tons, a total of 3,150 tons. Armored cruisers have an aggregate tonnage of 111,900; there are eight vessels of this type of about 14,500 tons each. First class cruisers are the *Brooklyn, Charleston, Rochester* and *Saint Louis*, of about 9,700 tons each. The *Chicago, Columbia, Minneapolis* and *Olympia* are second class cruisers, with an aggregate tonnage of 25,065. There are 15 third class cruisers of from 2,072 to 3,430 tons, with an aggregate of 47,820 tons. In addition there are 38 gunboats of from 190 to 1,500 tons, with a total tonnage for the class of 36,055 tons. There are 148 submarines, of which about 100 are new vessels of the improved "AA," "R" and "S" types. The total tonnage of the new submarine fleet approximates 118,000.

Navy Organization.— The President of the United States is the commander-in-chief of the navy. Its affairs are administered by the Navy Department, of which the Secretary of the Navy is the head. The Assistant Secretary of the Navy performs such duties as may be assigned him by the secretary, the most important being the supervision of naval stations in insular possessions, the Marine Corps, War College, building of ships in navy yards and fitting of vessels for sea. The navy is governed by the Articles for the Government of the United States Navy, and statutes of Congress, orders of the President and secretary and a code called Regulations for the Government of the Navy of the United States.

The business of the Navy Department is distributed as the secretary deems expedient among eight bureaus. The Bureau of Yards and Docks controls docks and buildings in Navy Yards. The Bureau of Equipment provides coal, all equipments of ships and electrical appliances afloat, and supervises the Hydrographic Office and distribution of charts therefrom, the Naval Observatory, *Nautical Almanac* and Compass offices. The Bureau of Navigation promulgates orders, regulates details of officers and enlistment of men, supervises the Naval Academy and all naval educational institutions, the Naval Home, keeps the service records and looks after discipline. The Bureau of Ordnance has charge of armor and armament of all kinds and mechanism thereto pertaining, besides governing the Torpedo Station, naval proving grounds and shore magazines. The Bureau of Construction and Repair designs, builds and repairs ships and supervises docking them. The Bureau of Steam Engineering designs, builds and repairs steam machinery. The Bureau of Supplies and Accounts buys provisions, clothing, small and contingent stores and keeps the accounts of officers and men. The Bureau of Medicine and Surgery looks after the health of the force and controls all laboratories, naval hospitals and dispensaries. The office of the Judge-Advocate General of the Navy is independent of the bureaus and takes charge of courts-martial and courts of inquiry, examines claims against the department and attends generally to its legal work.

There are already certain permanent boards of naval officers which take part in the admin-

istration. The General Board, presided over by the admiral of the navy, considers questions of naval policy and strategy and advises the secretary. The Board of Inspection and Survey inspects and reports on the efficiency of ships in commission. The Lighthouse Board controls the lighthouse establishment. For the distribution of navy yards and naval stations see NAVY YARDS. The navy provides vessels and officers for the Commission of Fish and Fisheries and for the nautical schools of Massachusetts and New York. It also maintains naval attachés at the United States embassies and legations at London, Paris, Saint Petersburg, Berlin, Rome, Vienna, Tokio and Peking. Jointly with the Treasury Department it manages the lighthouses and provides officers for their inspection.

Personnel.— Officers are commissioned or warranted. Commissioned officers belong either to the "line" or to the "staff." The grades of line officers are admiral, rear-admirals, captains, commanders, lieutenant-commanders, lieutenants, lieutenants, junior grade, ensigns and midshipmen. The staff officers include the Medical Corps, consisting of medical directors, medical inspectors, surgeons, passed assistant surgeons and assistant surgeons; the Pay Corps of pay directors, pay inspectors, paymasters, passed assistant paymasters and assistant paymasters. There are chaplains of various grades, professors of mathematics, naval constructors, civil engineers and the admiral's secretary. All line officers, excepting those appointed from the warrant officers, are graduated from the United States Naval Academy (q.v.). Promotion up to rear-admiral is by seniority only — subject to physical and professional examination at each step. The office of admiral is personal and expires with the individual holder. The staff officers are promoted by seniority in their several corps. The warrant officers include boatswains, gunners and carpenters, in each of which corps there are two grades, chief sailmakers, warrant machinists, pharmacists and mates. The great majority are appointed from the enlisted force. Chief warrant officers rank with but after ensigns. Promotion in the warrant grades is by seniority.

Enlisted Men.— Only citizens of the United States can be enlisted. The recruit must be able to write and speak English, have no physical disabilities, nor be a deserter or a minor under 14 years of age. The age limits vary with the rating — thus on first enlistment, a landsman must be between 18 and 25, unless he has a mechanical trade, when he can enlist up to 35, which is for all ratings the maximum. The enlistment term is two years — no enlistments for special service are allowed. Re-enlistment requires proof of creditable discharge. Enlisted men are classified into chief petty officers, petty officers of the first, second and third classes and seamen of the first, second and third classes. They are again classified into the seaman branch, artificer branch, special branch and messmen branch. The seaman branch includes such petty officers as boatswains' mates, gun captains and the like, and ordinary seamen, landsmen, together with the three classes of naval apprentices. The artificer branch includes all the machinists, electricians, carpenters, firemen and coal passers, the special branch, the stewards, hospital attendants and musicians, and the messmen branch, the cooks, stewards and mess attendants. Petty officers are appointed by captains of ships from the enlisted force. Two years' service at sea is required for rating as ordinary seaman and four years for seaman. Gun pointers are selected for merit and any one is eligible who shows the necessary natural aptitude. Those who become expert receive as high as $10 per month in addition to their regular pay.

Apprentices are enlisted between the ages of 16 and 17 with the consent of parents or guardians and must engage to serve until 21. They are instructed in the rudiments at the training station at Newport, R. I., and at San Francisco, Cal., for six months and then go to the training ships for a year's cruise at sea, after which they are promoted from the third class to the second and assigned to the fleet. One year later they are rated in the first class and are eligible for petty office. Their instruction is continued during their apprenticeship and they have other special privileges.

Retirement of officers is compulsory at age of 62, also for disability and under certain conditions under Act of 3 May 1899. It is voluntary after 40 years' service and above the grade of lieutenant-commander. Retired officers (according to the law under which they retire) receive either three-fourths or one-half the sea pay of their grade on the active list or one-half their leave pay. Enlisted men can retire after 30 years' service and attaining age 50 unless physically disqualified for duty. They receive three-fourths of the pay in the rating they held when retired.

The Naval Home at Philadelphia (formerly called the Naval Asylum), built in 1832, provides a retreat for old officers and sailors.

The faculty is mainly composed of graduate naval officers. The new buildings of the Academy recently completed represent an aggregate expenditure of nearly $12,000,000 and form the most magnificent educational structures in the world. The War College, founded by Rear Admiral Stephen Bleecker Luce, United States Navy, in 1883 is established at Newport, R. I. It is not a school, but a place for discussion of naval problems by officers of all grades, forming committees in attendance usually during the summer months. It specially considers matters of strategy, planning of campaigns, etc.

The naval stations and constructive and repairing establishments are at Portsmouth, N. H.; Boston, Mass.; Brooklyn, N. Y.; League Island, Pa.; Washington, D. C.; Norfolk, Va.; Pensacola, Fla.; Mare Island, Cal.; and Puget Sound, Wash.; and naval stations at Newport, R. I.; New London, Conn.; Charleston, S. C.; Port Royal, S. C.; Key West, Fla.; New Orleans, La.; Guantanamo, Cuba; Guam, Hawaii; Tutuila, Samoa; Cavite, P. I.; Olongapo, P. I.

Naval Policy.—It is the policy of the United States, not to have the largest navy, but one which shall be fully adequate for the maintenance of its peace and in every particular of the highest attainable efficiency. At the present time our naval armament is somewhat below the minimum for the work demanded of it. A battleship requires about 40 months to build and it takes six years to produce a competent naval officer. So also it takes time to train men to handle the complicated mechanism

which is essential to the modern war vessel. The training facilities of the country and the means for obtaining the enlisted force are inadequate. A naval reserve is necessary from which to draw men at once in case of need. A naval militia (q.v.) co-ordinated with the regular service is also of great value, especially for harbor and coast defense. Several States have established such militia, but its development has been greatly retarded by lack of proper national encouragement and support. The distribution of our naval force in time of peace is in two fleets and four separate squadrons. The North Atlantic fleet includes the east coast of the United States and West Indies, and is divided into the Battleship, the Carribbean and the Coast squadrons. The Asiatic fleet covers the east Asiatic coast and the Philippines and is divided into the Northern and Southern squadrons; the European squadron, the South Atlantic squadron which cruises on the east coast of South America, the Pacific squadron, which ranges over the whole west coast of both continents, and the Training squadron. See also NAVAL ARCHITECTURE; NAVY, HISTORY OF; NAVAL SERVICE, THE.

Bibliography.— For histories of the navy consult Cooper's (1839); Maclay's (1895–99); Spears' (1897); also Aldrich's 'History of the Marine Corps.' A great deal of information will also be found in Hammersley's 'Naval Encyclopedia' (1881) and subsequent editions. Niles' 'Register and American State Papers' may also be consulted. The 'Official Records of the United States and Confederate Navies during the War of the Rebellion' contain all reports and like matter, and are published by the Navy Department. Consult also files of the *Army and Navy Journal* 1863 to date. For current progress, the yearly reports of the Secretary of the Navy and of the bureaus — the publications of the Office of Naval Intelligence and of the United States Naval Institute are indispensable. Consult also 'The United States Navy Year Book' (annual, Washington, D. C.) For the Naval Academy, consult the history of that institution by Park Benjamin, and the yearly 'Registers' obtainable from the superintendent, which give all qualifications for entrance course, etc. For government and organization consult 'Regulations for the Government of the Navy' (current issue), and for personnel and stations, the current 'Navy Register.' For construction of ships consult 'Proceedings of the Institute of Naval Architects and Marine Engineers.'

JOHN B. MCDONNELL,
Editorial Staff of The Americana.

57. NAVY OF THE UNITED STATES, Chronological History of. The following condensed history of the United States navy embodies all the essential details of every noteworthy sea fight in which this country has been engaged from 1775 to 1919. Leading incidents of legislative and popular interest are also included, all being compiled from the most authentic official and historical sources.

1775. June 12 — First sea fight of the Revolution off Machias, Me. Two small coasting vessels manned by volunteers (armed chiefly with axes and pitchforks) under command of Jeremiah O'Brien, captured, after a severe battle, the English war cutter *Margaretta*, Lieutenant Moore, Americans, 1 killed, 6 wounded; English, 5 killed, 9 wounded.

1775. July 12 — Two American trading vessels (armed for the emergency) attacked and captured, in Bay of Fundy, two regular English cruisers which had been fitted out expressly to avenge the *Margaretta*. Jeremiah O'Brien, again, was American commander.

1775. Oct. 13 — First official step toward the establishment of United States navy, Silas Deane, John Adams and John Langdon ("Fathers of Our Navy") being appointed a committee by Congress to fit out two warships to cruise against the British.

1776. Jan. 15 — Seventeen volunteers put out of Newburyport, Mass., in three whale boats (under Capt. Offin Boardman) and by clever stratagem captured an armed ship laden with provisions consigned to the British army at Boston.

1776. Jan. — — First flag ever unfurled aboard an American warship was hoisted by 1st Lieut. John Paul Jones on board the flagship *Alfred*, at Philadelphia. It was the "grand union" flag, having 13 American stripes with the English union jack in the field.

1776. Feb. 17 — First regularly organized naval expedition of the United States put to sea under the orders of Capt. Esek Hopkins. Its object was the capture of the island of New Providence, in the Bahamas, where there were large quantities of military stores. The fleet consisted of the 24-gun ship *Alfred*, 20-gun ship *Columbus*, 14-gun brigs *Andrea Doria* and *Cabot*, 12-gun brig *Providence*, 10-gun sloop *Hornet* and 8-gun schooners *Wasp* and *Fly*.

1776. March 3 — American sailors and marines from Hopkins' fleet landed at New Providence, captured the two forts, made prisoner of Governor Brown, held the place two weeks and, on 17 March, sailed with the military stores.

1776. April 6 — While entering Long Island Sound, Hopkins' fleet was attacked by the English 20-gun cruiser *Glasgow*, which was driven off only after a spirited action of several hours. The next day the fleet arrived at New London.

1776. April 17 — American cruiser *Lexington*, Capt. John Barry, captured English cruiser *Edward* after fighting one hour. Americans, 2 killed, 2 wounded; English loss much greater.

1776. May 9 — American 8-gun schooner *Wasp*, Capt. Charles Alexander, captured English armed vessel *Betsey*.

1776. June 17 — Connecticut State cruiser *Defense*, Captain Harding, after an all day fight, captured two English transports, having on board about 300 soldiers of the British 71st Regiment; their major (Menzies) was among the killed.

1776. July 4 — On this day England had on the North American coast 78 warships, mounting 2,078 guns. The American navy at the same time consisted of 25 warsnips, 422 guns. Of these ships only six were built for war purposes.

1776. Sept. 1 — Capt. John Paul Jones, in command of the 12-gun cruiser *Providence*, escaped from 28-gun English frigate *Solebay*, by an extraordmary manœuvre.

1776. Oct. 11 — First battle of Lake Champlain. The American flotilla, of 15 vessels, carrying 88 guns and 700 men, under command of Gen. Benedict Arnold, made a stubborn fight against the English flotilla of 25 vessels, 89 guns and 1,000 men, under Captain Pringle. The American fleet was manned and officered mostly by soldiers, while the English craft were manned by men from the Royal navy. Although the Americans were defeated they inflicted irreparable loss and delay on the enemy.

1776. Nov. 13 — American 24-gun ship *Alfred*, Capt Hoysted Hacker, captured English transport *Mellish* and with valuable supplies for General Burgoyne's army then at Montreal. Among the stores were 10,000 suits of uniform.

1776. Dec. 31 — During the year 1776 the Americans captured 342 English vessels. An English account says that the damage to the West India trade alone was nearly $2,000,000.

1777. March — — English 28-gun frigate *Milford* captured 14-gun American brig *Cabot*, Capt. Joseph Olney.

1777. April 9 — 28-gun American frigate *Trumbull*, Capt. Dudley Saltonstall, captured two English armed transports off New York laden with military stores.

1777. May 7 — American cruiser *Surprise*, Capt. Gustavus Conyngham, in the English Channel, captured British packet *Prince of Orange*. So unexpected was the presence of Yankee warships in this part of the world that Captain Conyngham had entered the English cabin, where he interrupted the latter's breakfast, before the presence of an enemy was known.

1777. May — — About the middle of May the 32-gun frigate *Hancock* captured the English 28-gun frigate *Fox*. American casualties, 8 killed or wounded; the English, 32.

1777. June 1 — American frigate *Hancock* captured by English squadron off Halifax.

1777. June 14 — Design of present American flag adopted: the 13 stripes representing the original 13 States and a star for each State in the Union.

1777. Aug. — — In this month the first submarine boat ever invented made an attack on the British frigate *Cerberus*, which had it not been for imperfect mechanism, the craft would have been totally destroyed. Four of her crew were killed.

1777. Sept. 3 — On the night of this day the 32-gun frigate *Raleigh*, Capt. Thomas Thompson, stole into a fleet of English merchantmen and attacked the convoying war ship *Druid*. The *Druid* was reduced to a sinking condition before Americans were driven off by superior forces.

1777. Sept. 20 — The 16-gun cruiser *Lexington*, Capt. Henry Johnson, captured the British 10-gun cruiser *Alert*, after two hours' spirited fighting and a chase of four hours. The English commander, Lieutenant Bazely, afterward became an admiral.

1777. Nov. 13 — Capt. John Paul Jones, in 18-gun American cruiser *Ranger*, while in Quiberon Bay, France, received the first salute to the Stars and Stripes in Europe.

1777. Dec. 31 — In 1777 the Americans captured 467 vessels from the Englisn.

1778. Jan. 1 — At the beginning of the year 1778 the British had on the North American station 89 warships with a total of 2,576 guns, while the Americans had 14 vessels witn 332 guns.

1778. Jan. 27 — Sailors from the United States 12-gun ship *Providence* landed on the island of New Providence, captured the forts and seven vessels in the harbor and carried away a large quantity of military supplies.

1778. March 7 — Our 32-gun frigate *Randolph*, Capt. Nicholas Biddle, in order to protect a convoy of merchantmen, attacked the 74-gun ship of the line *Yarmouth*. The *Randolph* was blown up, all but four of her 315 people perished.

1778. March 9 — The 24-gun ship *Alfred* captured by two English warships.

1778. April 22 — Capt. John Paul Jones lands at Whirehaven, England, and sets fire to the shipping in the harbor.

1778. April 24 — Action between the *Ranger*, Captain Jones, and the *Drake*, Captain Burdon, in the Irish Sea. The Americans captured the *Drake* after an action of one hour. Casualties: Americans 8; English 42.

1778. Sept. 27 — Our 32-gun frigate *Raleigh*, after a chase of several days, captured by English after being run ashore on the coast of Maine; all the crew escaped.

1779. Feb. 2 — First and only serious mutiny in the United States navy occurred in the 32-gun frigate *Alliance* at sea, while under a French commander, Pierre Landais, General Lafayette being on board as a passenger.

1779. May 7 — Our 12-gun brig *Providence*, after desperate action of one hour, captured English warship of about the same force. The enemy lost 27 out of a crew of only 53. The Americans had 4 killed and 10 wounded.

1779. Sept. 23 — Famous action between *Bonhomme Richard*, Capt. John Paul Jones, and English frigate *Serapis* off eastern coast of England. Early in the battle the ships anchored side by side. The Englishman was carried by boarding. Shortly afterward the *Bonhomme Richard* sank.

1780. June 2 — One of the most obstinate naval battles of the Revolution fought between 28-gun frigate *Trumbull*, Capt. James Nicholson, and English privateer *Watt*, The *Trumbull* was dismasted and the *Watt* escaped. The American loss was 39; that of the enemy, 92.

1780. July 9 — Massachusetts State cruiser, *Protector*, Capt. J. F. Williams, blew up the English privateer *Admiral Duff*. Only 55 of the Englishmen were saved. Americans lost 6 killed or wounded.

1780. Aug. 13 — A large American naval and military force was captured on this day at the mouth of the Penobscot River, Me., by the British under Sir George Collier. Three of our government cruisers and a number of privateers were lost.

1780. Oct. 8 — United States ship *Saratoga* captured English armed ship *Charming Molly*. A few days afterward the *Saratoga* was lost at sea with all hands.

1781. May 28 — Our 28-gun frigate *Trumbull* captured by British squadron in a night attack; many of the American crew being in a state of mutiny.

1781. June 22 — United States 32-gun frigate *Confederacy* captured at sea by two English frigates while returning from France with military supplies.

1781. Aug. — — Our 28-gun frigate *Trumbull*, Capt. James Nicholson, captured off Halifax by two British frigates.

1782. April 8 — The Pennsylvania State cruiser *Hyder Ally*, Capt. Joshua Barney, in a desperate battle defeated English cruiser *General Monk* in Cape May Roads. Our casualties were 15; that of the English, 53.

1783. In the Revolution the British had 202 warships captured or destroyed. In all there were about 800 vessels taken from the British by our sea forces.

1785. July 25 — American schooner *Maria* of Boston seized by Algerian corsairs and her crew thrown into captivity. This resulted in a naval war against all the states of Barbary.

1794. March 27 — On the close of the Revolution the navy was disbanded and it was not until this day that Congress took steps to create a new navy. By this act six frigates were authorized. They were the famous group to which the *Constitution*, etc., belonged.

1798. April 30 — Secretary of the navy added to the President's Cabinet, Benjamin Stoddart being the first Secretary.

1798. July 9 — Congress declared naval war upon France because of the persistent depredations on our commerce by French cruisers and privateers.

1798. Nov. 16 — Our 20-gun warship *Baltimore*, Capt. Isaac Phillips, boarded by the British 74-gun ship *Carnatic*, while at sea, and several of the American crew were impressed out of her. This was one of the outrages that led to the War of 1812.

1799. Feb. 9 — Our 36-gun frigate *Constellation*, Capt. Thomas Truxtun, fought and captured French 40-gun frigate *Insurgent*, Captain Barraeut, after an action of over one hour. Our losses were 5 killed or wounded, while that of the French was 70.

1800. Feb. 2 — *Constellation* had a running fight with the French 40-gun frigate *Vengeance*, Capt. A. M. Pitot, which lasted five hours. Owing to the damages in his rigging, Captain Truxtun was unable to capture his opponent, who finally escaped. American casualties, 39 killed or wounded; French, 160.

1800. July 14 — The captured French frigate *Insurgent*, Capt. Patrick Fletcher, sailed on a cruise in the West Indies and was never heard from. This was one of the first great disasters in the United States navy.

1800. Oct. 12 — The 28-gun frigate *Boston*, Capt. George Little, in a two-day fight with the French corvet *Berceau*, Capt. Andre Senez, finally captured her.

1801. Feb. 3 — Treaty of peace with France ratified. In this war 84 armed vessels were captured from the French, while the French captured only one of our warships, the *Retaliation*.

1801. May 14 — The Bashaw of Tripoli declared war against the United States because we did not pay our "tribute" promptly. About the same time other potentates of the semi-piratical states of Barbary began hostile measures against the United States.

1801. July 1 — First considerable squadron of American warships crossed the Atlantic and arrived at Gibraltar. It consisted of the frigates *President*, *Philadelphia* and *Essex*, under the command of Capt. Richard Dale, and was sent to make war on the states of Barbary.

1801. Aug. 1 — Our 12-gun schooner *Enterprise*, Lieut. Andrew Sterrett, in a three-hour fight with the Tripolitan war polacre *Tripoli*, captured her. There were no American casualties, but the Tripolitans had 50 killed or wounded.

1803. June 22 — American squadron under the command of Capt. John Rodgers, attacked a large Tripolitan war ship and nine gunboats off the harbor of Tripoli. The gunboats were driven into the harbor; the warship was destroyed.

1803. Oct. 31 — While chasing a Tripolitan craft, the 36-gun frigate *Philadelphia*, Capt. William Bainbridge, ran aground off the harbor of Tripoli. The following day he was compelled to surrender.

1804. Feb. 16 — Lieut. Stephen Decatur with 74 volunteers manned the ketch *Intrepid* and, under cover of night, ran into the harbor of Tripoli and destroyed by fire the frigate *Philadelphia*, which the Tripolitans had captured the year before.

1804. Aug. 3 — Americans began that series of bombardments on Tripoli which resulted in the capture of the place.

1804. Sept. 4 — Richard Somers with 11 volunteers manned the ketch *Intrepid* (which had been fitted as a floating mine to be exploded among the Tripolitan shipping) and, under cover of night, carried her into the harbor of Tripoli. The ketch was exploded and every one of the Americans was killed.

1805. June 3 — Treaty of peace signed with Tripoli.

1807. June 22 — Our 36-gun ship *Chesapeake*, Capt. James Barron, attacked off the Virginian coast by the 50-gun English frigate *Leopard* and was compelled to surrender. Three of the American crew were taken aboard the English ship. This outrage hastened the War of 1812.

1811. May 16 — Our 44-gun frigate *President*, Capt. John Rodgers, at night was fired upon by the English 22-gun warship *Little Belt*. The Americans promptly returned the fire and compelled the English to surrender, after which the *Little Belt* was permitted to proceed.

1812. June 18 — Congress declares war against Great Britain. At that time England had 1,048 warships with 27,800 guns, and the United States 17 warships with 442 guns.

1812. July 31 — Our 3-gun schooner *Julia* attacked in the Saint Lawrence river near Ogdensburg by the English war craft *Earl of Moira* and the *Duke of Gloucester*. The English were driven off with heavy losses.

1812. Aug. 13 — First naval action of the War of 1812. The 32-gun frigate *Essex*, Capt. David Porter, captured

the English 16-gun sloop of war, *Alert*. Only 3 of the enemy were wounded. No American casualties.

1812. Aug. 13 — First frigate action of the war, the 44-gun frigate *Constitution*, Capt. Isaac Hull, captured the English 38-gun frigate *Guerrière*, Capt. James Richard Dacres. The battle lasted only 40 minutes, the Americans having 14 killed or wounded and the enemy 78.

1812. Oct. 7 — At night a boat party of Americans on Lake Erie attacked and captured the English war craft *Detroit* and *Caledonia* near Buffalo. The Americans were led by Lieut. Jesse Duncan Elliott.

1812. Oct. 17 — Our 18-gun sloop of war *Wasp*, Capt. Jacob Jones, after an action of 43 minutes, captured the English 18-gun war brig *Frolic*. The Americans had 10 killed or wounded, and the English 62.

1812. Oct. 25 — The 44-gun frigate *United States*, Capt. Stephen Decatur, after an action of an hour and a half captured the English 38-gun frigate *Macedonia*, Capt. John Surnam Carden. Our casualties were 12 killed or wounded; the enemy lost 104.

1812. Dec. 29 — Capt. William Bainbridge in the 44-gun frigate *Constitution* captured, off the coast of Brazil, the English 38-gun frigate *Java* after an action lasting nearly two hours. The Americans had 34 killed or wounded; the English, 161.

1813. Feb. 24 — The 18-gun sloop of war *Hornet*, Capt. James Lawrence, captured, after a sharp action of 15 minutes, English sloop of war *Peacock* of the same force, her commander, William Peake, being killed. The American casualties were 5 killed or wounded; that of the enemy, 38. The *Peacock* was sunk in the action.

1813. June 1 — American 36-gun frigate *Chesapeake*, Capt. James Lawrence, captured after a desperate action of 15 minutes off the port of Boston, by the English 38-gun frigate *Shannon*, Capt. Philip B. V. Broke. The Americans had 146 killed or wounded and the English 83. Lawrence was killed, his last words being "Don't give up the ship."

1813. Aug. 14 — The American 18-gun sloop of war *Argus*, Capt. Wm. Henry Allen, captured off English coast by British war ship *Pelican* (of the same force), Capt. John Fordyce Maples, after a severe action of 47 minutes in which the American commander was mortally wounded. The Americans had 23 killed or wounded; the English 7.

1813. Sept. 4 — The 12-gun schooner *Enterprise*, Capt. William Burrows, captured English sloop of war (of the same force) *Boxer*, Capt. Samuel Blythe, after an action of 40 minutes, off Monhegan, on the coast of Maine. Both the American and English commanders were killed. Our casualties were 12 killed or wounded; that of the English, 21.

1813. Sept. 10 — Battle of Lake Erie fought. The American squadron carrying 54 guns, under the command of Oliver Hazard Perry, captured the English squadron of 63 guns under the command of Capt. Robert Heriot Barclay. Our casualties were 123 killed or wounded; that of the British, 135. The direct result of this battle was the overthrow of British supremacy in the Western territory.

1814. Jan. 29 — The United States schooner *Alligator* repulsed a boat attack from the British frigate *Narcissus* with heavy loss to the enemy.

1814. March 28 — Capt. Davis Porter in the 32-gun frigate *Essex* made a heroic defense against the British warships *Phœbe* and *Cherub* at Valparaiso, Chile. After a fight of 2 hours and 20 minutes the *Essex* surrendered, our losses being 155 killed or wounded; that of the English, only 15.

1814. April 29 — Our 20-gun sloop of war *Peacock*, Capt. Lewis Warrington, after an action of 45 minutes, captured the English sloop of war (of the same force) *Epervier*, Capt. Richard Wales. American loss, 2 killed or wounded; English, 23.

1814. June 28 — Capt. Johnston Blakeley, in the 18-gun sloop of war *Wasp*, captured the English war ship *Reindeer* off the English coast after an action of 19 minutes, the Americans having 26 killed or wounded as against 67 for the enemy.

1814. Sept. 1 — At night the *Wasp* had a battle with the English sloop of war *Avon* of less force. The *Avon* was sunk after an action of 43 minutes in which the Americans had 3 killed or wounded and the enemy 42.

1814. Sept. 11 — Second battle of Lake Champlain between American squadron under Captain Macdonough and English under Capt. Daniel Pring. The American force carried 86 guns and 850 men, the English 92 guns and 1,000 men. After an action of 2 hours and 20 minutes the English were defeated, our losses being 110 killed or wounded; that of the enemy, 194.

1814. Dec. 14 — Forty-two English launches, containing 42 guns and about 1,000 men, attacked the American flotilla on Lake Borgne, Miss., and after a spirited fight defeated it, the American casualties being 41 killed or wounded; the English, 94.

1815. Jan. 15 — The 44-gun frigate *President*, Capt. Stephen Decatur, captured by a British squadron after a chase of two days. The Americans did not surrender until they had 80 killed or wounded and the enemy 25.

1815. Feb. 20 — While cruising off the coast of Portugal the 44-gun frigate *Constitution*, Capt. Charles Stewart, after an extraordinary night battle, captured English war ships *Cyane* and *Levant*, having a total of 55 guns as opposed to the 51 in the *Constitution*. Our casualties were 14 killed or wounded; the English, 77.

1815. March 23 — The 18-gun sloop of war *Hornet*, Captain Biddle, after a spirited action off Tristan d'Acunha, captured English sloop of war *Penguin* of the same force in 22 minutes. American casualties, 12 killed or wounded; the English, 38.

1815. June 17 — Before the war with England had been concluded the United States had declared war on Algiers as the result of outrages on American merchantmen. A squadron under Captain Decatur appeared in the Mediterranean and on 17 June captured the Algerian flagship *Mashouda*.

1815. June 30 — While in the Straits of Sunda (East Indies) the 18-gun sloop of war *Peacock*, Captain Warrington, captured English cruiser *Nautilus* of 12 guns, the enemy having 14 killed or wounded. There were no American casualties.

1821. From this year to the close of 1825 our naval forces were actively engaged in suppressing piracy in the West Indies and slave trade on the African coast.

1832. Feb. 7 — For making a murderous attack on American merchantmen, the 44-gun frigate *Potomac* landed a large force of men in Sumatra and attacked the town of Qualla Battoo, killing a large number of the natives and destroying their forts.

1838. Dec. 20 — Qualla Battoo again bombarded, for repetition of outrages; this time by the corvet *John Adams*, Capt. George C. Reid.

1846. July 2 — A force of 250 men from American squadron under Capt. John Drake Sloat, landed at Monterey, Cal., and occupied the place in the name of the United States.

1846. Oct. 16 — American naval force under Capt. David Connor made unsuccessful attempt to capture Tuspan, Mexico.

1846. Oct. 26 — Naval force under command of Capt. Matthew Calbraith Perry captured, after a severe fight, Mexican city of Tabasco.

1846. Nov. 20 — Boat containing 7 Americans, under command of Lieutenant Parker, entered harbor of Vera Cruz at night, boarding the enemy's bark *Creole* (laden with munitions of war), burned her under the guns of the fort.

1847. Jan. 8 — Capt. Robert F. Stockton led a force of about 700 American sailors on a long march inland and defeated a Mexican army at San Gabriel, Cal. The battle was resumed on the following day at Mesa and again the enemy was routed. On the 15th our sailors marched into Los Angeles in triumph; having actually conquered the lower part of California.

1847. March 10 — Steam cruiser *Spitfire* ran into the harbor of Vera Cruz and, single-handed, engaged the Mexican batteries.

1847. March 23 — Commander Tattnall with seven small gunboats boldly ran within close range of the heaviest fort at Vera Cruz and delivered a terrific fire for an hour. So unexpected was the attack that the Mexicans were scarcely able to reply.

1847. March 24-25 — The navy and army maintained the furious attack on Vera Cruz which, finally, resulted in the surrender of that place.

1847. June 14 — Strong naval force under Capt. M. C. Perry captured Tuspan after severe fighting. At one time our sailors landed and carried the Mexican earthworks by storm.

1847. June 30 — Captain Bigelow with 240 sailors marched against the town of Tamultay and captured it after suffering a loss of 2 killed and 5 wounded.

1847. Oct. 1 — A force of 80 sailors under Lieutenant Craven landed at Mulije, Lower California, and defeated a superior number of Mexicans, driving them several miles inland.

1847. Nov. 10 — Captain Shubrick landed 600 men from his squadron and captured the city of Mazatlin, Mexico.

1847. Nov. 17 — A force of sailors under Commander Selfridge captured the city of Guaymas, Lower California, after severe fighting.

1848. Jan. 30 — Lieutenant Yard with a detachment of sailors landed and surprised a body of Mexican troops near Cochori, Lower California.

1848. Feb. 6 — Lieut. Charles Heywood of the Marines made an attack on the Mexicans at San Jose, Lower California. Attack was renewed the next day and the enemy defeated with a loss of 15 killed or wounded.

1853. July 14 — Com. M. C. Perry landed his expedition at Yokohama, Japan, and formally delivered the message of friendship from the President of the United States to the emperor. It resulted in the opening of Japan to foreign commerce.

1854. Feb. 12 — Perry appeared off Tokyo with an imposing fleet to receive the answer from the emperor.

1856. Nov. 20 — Because the Chinese forts wantonly fired on the American at Canton, a large force of sailors and marines was landed under Commander Andrew Hull Foote, and, after a two days' fight, the Chinese were defeated with a loss of about 400 killed or wounded; the Americans having 12 killed and 28 wounded.

1859. June 25 — Captain Tattnall made his famous dash to the assistance of the British and French who were sorely pressed in their attack on the Peiho forts, North China. It was on this occasion that Tattnall exclaimed "Blood is thicker than water."

1861. April 21 — Captain McCauley destroyed all United States stores at Norfolk, Va., to prevent their falling into the hands of the Confederates.

1861. May 31 — With frail gunboats Commander James Harman Wood attacked the Confederate batteries at Aquia Creek, near Washington, D. C. The attack was renewed the next day, but failed; the Nationalists having 1 killed (Commander Ward) and 4 wounded.

1861. Aug. 29 — Capt. Silas H. Stringham with a powerful squadron of wooden warships bombarded Fort Hatteras and compelled the surrender of its garrison of 615 men. The Confederate loss was 29 killed or wounded.

1861. Sept. 10 — Two gunboats commanded by Lieut. Roger N. Stembel opened fire on a Confederate battery of 16 guns near Columbus, Ky., and destroyed it.

1861. Sept. 14 — A boat party under Lieut. John Henry Russell pulled into the harbor of Pensacola and, after a desperate fight, captured and destroyed the Confederate privateer *Judah*. About 20 of the boat party were killed or wounded; enemy's loss, unknown.

1861. Oct. 1 — The improvised Union gunboat *Fanny* while operating in Pamlico Sound, North Carolina, was captured in a daring manner by a party of Confederates under Capt. Wm. F. Lynch.

1861. Oct. 5 — A regiment of Confederate troops while marching on the narrow island of Hatteras was fired upon by the National gunboat *Monticello*, Lieut. Daniel L. Braine, and routed with great loss.

1861. Oct. 12 — Capt. George Nicholas Hollinn with the Confederate ironclad *Manassas* and 6 wooden steamers came from New Orleans and put to flight the powerful Union squadron stationed near the mouth of the Mississippi River. The *Richmond* was nearly sunk and, by means of fire rafts, the enemy compelled our ships to flee.

1861. Oct. 28 — The little wooden gunboat *Conestoga*, Lieut. S. Ledyard Phelps, attacked a Confederate camp on the bank of the Cumberland River, inflicting a loss in killed and wounded.

1861. Nov. 7 — Capt. Samuel Francis Dupont with a powerful squadron of wooden ships captured, after a heavy bombardment, Port Royal, N. C., with a loss of 31 killed or wounded, the enemy's loss being 63.

1861. Nov. 8 — Union war steamer *San Jacinto*, Capt. Charles Wilkes, intercepted the English mail steamer *Trent* on the high seas and forcibly took out of her two Confederate agents, Mason and Slidell.

1861. Nov. 8 — Lieut. James E. Jouett led a boat party into the harbor of Galveston, Tex., under cover of night, and destroyed the war schooner *Royal Yacht*. The boat party had 9 casualties. The entire Confederate crew was captured.

1862. Feb. 6 — Capt. A. H. Foote with Union gunboats attacked Fort Henry on the Tennessee River and after a severe action compelled its surrender. The Union loss was 11 killed or wounded; the Confederate loss, 16.

1862. Feb. 10 — Union gunboats under Commander Rowan attacked the Confederate gunboats at Elizabeth City, N. C., and defeated them. The Union loss was 4 killed or wounded; that of the enemy, unknown.

1862. Feb. 13 — Commander Walke in the ironclad gunboat *Carondelet* attacked Fort Donelson, Cumberland River. After maintaining an all-day fight single-handed she retired at dark with several casualties.

1862. Feb. 14 — Union gunboats under Captain Foote made a determined attack on Fort Donelson and compelled it to surrender, the Union loss being 54 killed or wounded.

1862. March 8 — Confederate ironclad *Merrimac* entered Hampton Roads and, in spite of the terrific fire, totally destroyed the warships *Congress* and *Cumberland*. The Unionists had 254 killed or drowned, besides many wounded; the Confederate loss was only 21 killed or wounded.

1862. March 9 — The famous battle between the *Monitor* and *Merrimac* fought, in which the latter was finally driven off. Owing to the protection afforded by the armor none was killed and only a few wounded.

1862. March 14 — Naval force under Lieut. R. S. McCook captured the city of New Berne after a desperate fight in which the navy had 11 killed or wounded, while our land force suffered much more. The enemy's loss was even heavier.

1862. April 4 — Commander Walke in the *Carondelet* made his celebrated dash past the batteries at Island No. 10 in the Mississippi, which resulted in the abandonment of that post by the enemy.

1862. April 6 — Two wooden Union gunboats prevented the annihilation of the Union army at Pittsburg Landing on the Tennessee River, by pouring in a cross-fire on the charging Confederates.

1862. April 23 — Farragut, under cover of night, made his famous dash past Forts Jackson and St. Philip, which resulted in the fall of New Orleans. It was one of the most daring feats in naval history. The Union loss was 184 killed or wounded, while that of the enemy was about equal.

1862. April 25 — A naval force under Commander Samuel Lockwood captured Fort Macon, N. C., after an all-day fight.

1862. May 10 — On this day the Confederate naval force in the Mississippi made a sudden attack on the Union naval force near Fort Pillow, but were finally driven off with a loss of three killed or wounded.

1862. June 6 — Union gunboats under Captain Davis attacked the Confederate naval force at Memphis and defeated it. The casualties were inconsiderable.

1862. June 17 — A naval and land force captured Saint Charles on the White River, after a bloody struggle in which 150 of the Unionists were killed or wounded The Confederate loss is unknown.

1862. June 28 — Farragut made his perilous dash past the Confederate batteries at Vicksburg, with a loss of 37 killed or wounded. The enemy reported no losses.

1862. July 4 — Commander Trenchard in the *Rhode Island* dispersed Confederate troops at Galveston, and destroyed the blockade runner *Richard O'Brien*, with its valuable cargo.

1862. July 9 — Two gunboats and 40 soldiers under Lieut. Charles W. Flusser forced the barricades in Roanoke River and, after a hot fight, captured Hamilton, N. C. Union losses, three killed or wounded.

1862. July 15 — Captain Walke with a small squadron attacked the ironclad *Arkansas* in the Yazoo River. A running fight followed, the *Arkansas* speeding down the Yazoo into the Mississippi and past the great Union fleet and took refuge under the Vicksburg batteries. That night the Union fleet attacked the ram and so injured her that she was of little service. The Unionists lost 68 killed or wounded, while that of the ram was 25.

1862. July 22 — Capt. Wm. D. Porter, with several gunboats, made another attack on the *Arkansas* and completed her destruction.

1862. Oct. 3 — A detachment of troops with a naval force under Lieut. E. R. Colhoun, captured Franklin after severe fighting in which 15 of our seamen were killed or wounded.

1862. Nov. 24 — While attempting to capture the town of Onslow, N. C., Lieut. Wm. B. Cushing, in the gunboat *Ellis*, ran aground and was attacked by the Confederates. Cushing pluckily defended his vessel two days, then setting her on fire escaped with the survivors.

1862. Dec. 31 — On the night of this day the famous *Monitor* foundered at sea while near Hatteras Shoals, her people being saved by convoying ships.

1863. Jan. 1 — Before daylight two Confederate "cotton-clad" steamers made a sudden attack on the Union squadron off Galveston, captured one vessel, destroyed another and dispersed the force with heavy loss.

1863. Jan. 9 — Rear-Admiral Porter, with a strong force of gunboats, captured Arkansas Post, on the Arkansas River, with a loss of 31 killed or wounded; Confederate losses being heavier.

1863. Jan. 11 — On this day the famous Confederate cruiser *Alabama* sank the National cruiser *Hatteras* off Galveston, after a short fight, the Confederates rescuing the survivors.

1863. Feb. 14 — The Confederates captured the Union warship *Queen of the West*, which had run aground in the Red River.

1863. Feb. 24 — Refitting the *Queen of the West*, the Confederates captured the new ironclad *Indianola* after a hot fight in the Mississippi River.

1863. Feb. 28 — Commander Worden in the monitor *Montauk*, at long range, destroyed the Confederate blockade runner *Nashville*.

1863. March 11 — Union gunboats began attack on Fort Pemberton on the Tallahatchie River, but were finally repulsed on the 18th with a heavy loss in killed and wounded.

1863. March 14 — Farragut passed Port Hudson, on the Mississippi, one of his ships, the *Mississippi* (on which was Lieut. Geo. Dewey) being destroyed by fire. The Unionists had nearly 100 killed or wounded.

1863. April 7 — Ironclads under Dupont off Charleston made a determined attack on the fortifications. The *Keokuk* was sunk and the other vessels were compelled to retire.

1863. April 16 — Rear-Admiral Porter ran his fleet past Vicksburg with little loss.

1863. April 29 — Union gunboats made an unsuccessful

attack on Grand Gulf, Mississippi River, in which they had 75 men killed or wounded.

1863. June 17 — Monitor *Weehawken*, Capt. John Rodgers, captured the Confederate ironclad *Atlanta*, Lieut. Wm. A. Webb. The Confederates had 18 wounded; no casualties for the Nationalists.

1863. July 10 — Rear-Admiral Dahlgren made a determined naval attack on the defenses of Charleston in conjunction with our troops, but after a severe action was compelled to retire.

1863. July 15 — While in Shimonoseki Straits, Japan, our warship *Wyoming* was fired on by the Japanese, Captain McDougal returned the fire, sank some of their ships and silenced their batteries. The Americans had six killed and four wounded. The Japs suffered heavily.

1863. July 18 — A combined land and naval attack was made on Fort Wagner, Charleston, but was repulsed by the Confederates.

1863. Sept. 8 — A boat party consisting of 400 men under the command of Commander T. H. Stevens attempted to surprise Fort Sumter, Charleston, but was repulsed with a loss of 16 killed or wounded and 102 taken prisoners.

1863. Sept. 8 — An army and naval expedition against Sabine Pass was repelled by the Confederates, the Nationalists having about 50 killed or wounded, while the gunboats *Clifton* and *Sachem* were compelled to surrender.

1864. Jan. 30 — The Confederates under Commander J. T. Wood made a night attack on Union gunboats guarding New Berne, N. C., and captured the *Underwriter*, with a loss of 39 killed, wounded and made prisoners; the Confederate loss being 28 killed or wounded.

1864. April 20 — Confederate ram *Albemarle* attacked Union gunboats at the mouth of the Roanoke River, North Carolina and sank the *Southfield*, a number of Unionists being killed or wounded.

1864. May 5 — The ram *Albemarle* attacked Union gunboats in Albemarle Sound and, after a desperate fight with our wooden gunboats, lasting several hours, was driven back. Several of the Union gunboats were disabled. The Unionists had 29 killed or wounded; the Confederate loss was less.

1864. May 6 — The Confederates blew up the Union gunboat *Commodore Jones* in Four Mile Creek, killing or wounding half her personnel. Two days later they destroyed our gunboat *Shawsheen*.

1864. June 19 — The *Kearsarge* sank the Confederate cruiser *Alabama* off Cherbourg, France, after a severe action. The Nationalists had 3 killed or wounded and the enemy 30.

1864. June 24 — Confederate shore batteries opened an unexpected fire on two Union gunboats in the Mississippi, near Port Hudson, but were silenced after an hour of hard fighting.

1864. Aug. 5 — Farragut made his famous dash past the forts at Mobile Bay, and on the same day captured the ironclad *Tennessee*, after one of the most desperate fights in naval history. The monitor *Tecumseh* was sunk while passing over a line of torpedoes, 93 of her crew of 114 perishing. Total Union casualties, 315; that of the Confederates being 32.

1864 Oct. 7 — Commander Napoleon Collins, in the warship *Wachusett*, captured the Confederate cruiser *Florida*, in the Brazilian port of Bahia, by boarding. Afterward the *Florida* was released, the attack being illegal.

1864. Oct. 28 — Lieut. Wm. B. Cushing, in a launch with 16 men, under cover of night, crept up the Roanoke River and destroyed the ironclad ram *Albemarle* by a torpedo.

1864. Nov. 4 — Two Union gunboats under Commander Shirk were destroyed in endeavoring to silence the Confederate batteries on the Tennessee River.

1864. Dec. 24 — First great naval and land attack on Fort Fisher, in which the Unionists were repulsed with a loss of 83 killed or wounded to the fleet alone, while the Confederate casualties were 58.

1865. Jan. 13 — Second naval and land attack on Fort Fisher, by which the fort was captured, our sailors and marines having 351 killed or wounded.

1865. Feb. 17 — Admiral Porter, with a strong naval force, captured Fort Anderson, with a loss of seven killed or wounded.

1866. Sept. — — Schooner *Gen. Sherman* ran aground in Ping Yang River, Korea, and her crew was clubbed to death.

1867. Jan. — — United States Steamship *Wachusett* visited scene of *Gen. Sherman* outrage, but failed to get satisfaction.

1870. Jan. 24 — United States Steamship *Oneida*, while steaming out of the harbor of Yokohama, Japan, homeward bound, was rammed by the English passenger ship, *Bombay*, and sunk; 117 of her 176 men perished.

1871. June 11 — A party from the American squadron attacked Korean forts in the Ping Yang River and carried them by storm, having 10 killed or wounded Lieutenant McKee being among the former.

1885. March 15 — Commander McCalla, with a force of sailors and marines, took posession of the Isthmus of Panama, to protect American interests.

1889. March 15 — The United States Steamship *Trenton*, *Vandalia*, and *Nipsic* wrecked by a hurricane at Apia, Samoa. The *Vandalia* was a total loss. About 50 of our officers and sailors were killed or drowned.

1891. Oct. 16 — A number of Cnileans mobbed a party of sailors from the United States Steamship *Baltimore* at Valparaiso, killing 2 and injuring 15. The Chilean government discountenanced the outrage and made ample atonement.

1894. Feb. 2 — The famous *Kearsarge* wrecked on Roncador Reef.

1898. Feb. 15 — United States battleship *Maine* blown up in Havana harbor, with a loss of 260 men out of a complement of 350. This was the second greatest disaster in our navy.

1898. March 19 — Battleship *Oregon* sailed from San Francisco on her famous voyage around the Horn.

1898. April 22 — Read-Admiral Sampson began the blockade of the north coast of Cuba.

1898. April 25 — United States declared that war with Spain existed from April 21st.

1898. April 27 — Sampson bombarded the Cuban port of Matanzas, silencing the Spanish batteries and preventing the erection of additional fortifications.

1898. April 29 — Commander McCalla drove a Spanish gunboat into the harbor of Cienfuegos.

1898. May 1 — Dewey destroyed the Spanish fleet under Montojo in the harbor of Manila, capturing Cavite and gaining complete possession of the harbor. Our casualties were 6, while that of the enemy was 618.

1898. May 11 — Cervera's squadron arrived off Martinique.

1898. May 11 — Commander Chapman Coleman Todd entered the harbor of Cardenas with the cruiser *Wilmington*, revenue cutter *Hudson*, and torpedo boat *Winslow*. The *Winslow* was suddenly attacked by a concealed battery and driven off in a crippled condition. The *Winslow* had five killed (including Ensign Worth Bagley) and two injured.

1898. May 11 — A boat party from Commander McCalla's squadron advanced on Cienfuegos, and under a terrific fire cut two submarine cables. We had eight killed or wounded.

1898. May 12 — Admiral Sampson bombarded San Juan, Porto Rico, silencing the enemy's guns. Our loss was eight killed or wounded.

1898. June 3 — Hobson made his famous dash with the collier *Merrimac* into the harbor of Santiago. The collier was destroyed and her entire crew made prisoners.

1898. June 6 — Sampson made the first bombardment of Santiago, the Spanish batteries being silenced. We had no casualties, but the enemy admit a loss of 54 killed or wounded.

1898. June 11 — The Spaniards began their attack on our marines at Camp McCalla, Guantanamo Bay. It was continued for several days, when a determined attack of the marines put the enemy to flight. Our loss was 28 killed or wounded; that of the enemy was greater.

1898. June 20 — Captain Glass occupied the island of Guam.

1898. June 22 — Captain Sigsbee, in the passenger steamer *Saint Paul*, disabled the Spanish torpedo boat destroyer *Terror*. No casualties for the Americans; the enemy having 2 killed and several wounded.

1898. June 30 — Lieut. Lucien Young, with small gunboats, silenced the Spanish batteries at Manzanillo.

1898. July 2 — Commander Swinburne destroyed the Spanish fortifications at Tunas, after a spirited action.

1898. July 3 — Cervera's formidable squadron was completely destroyed off Santiago after a spirited battle and chase lasting nearly four hours, by the American fleet under the immediate command of Admiral Sampson.

1898. July 15 — Commander Hunker attacked the Spanish batteries at Baracao. Only two Americans were injured.

1898. July 21 — A handsome dash was made into the port of Nipe by three gunboats under the orders of Commander Hunker, and destroyed the Spanish cruiser *Don Jorge Juan*.

1898. July 25 — Commander Richard Wainwright, in the *Gloucester*, occupied the port of Guanica, Porto Rico, being the first regular American force to land on that island in this war.

1898. July 27 — Lieutenant Merriam, with two boats' crews, took possession of Ponce, Porto Rico.

1898. Aug. 12 — Captain Goodrich attacked and compelled the surrender of Manzanillo.

1898. Aug. 13 — Dewey's fleet assisted army in attack on Manila, which resulted in the surrender of that place; Flag Lieutenant Brumby hoisting the first American colors over the city.

1900. May — Rear-Admiral Kempff, commanding the flagship *Newark* in Chinese waters, detached a body of marines, who, until the relief force arrived, co-operated with the small force of the Allies in Peking, in defense of the foreign embassies, besieged by the Boxer revolutionists. (See PEKING, THE SIEGE IN.)
1907. Cruise of an American fleet around the world as a demonstration of the naval power of the United States.
1914. Mexican complications led to the occupation of Vera Cruz by marines 21 April.
1917–18. The World War. Convoy of troops to Europe. Suppression of German submarine menace. Surrender of the German fleet 21 Nov. 1918 to the allied British and American navies in the North Sea.

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58. POLITICAL PARTIES. A political party has been defined by Edmund Burke as "a body of men united, for promoting by their joint endeavors the national interest, upon some particular principle upon which they are all agreed." But this definition is not adequate for the political party of to-day. The latter is more than a group of persons temporarily united for promoting a single principle. It is a more or less durable organization of voters, having for its immediate purpose the election of public officials and the control of the government. The members of the party may be agreed on certain fundamental principles of governmental policy; but the application of these principles will vary from time to time, and they are likely to become little more than a general tendency. Particular parties are apt to be largely controlled by certain classes or sections; and their policies are likely to be affected by the interests of their membership rather than those of the country as a whole.

In America, as in Great Britain, there have usually been only two leading political parties at one time; and this has led to the opinion that men naturally tend to divide themselves into two main groups: the conservative and the progressive, or those who favor the maintenance of order and efficient government and those who support individual liberty and freedom. But these tendencies are at best vague and indefinite, and the development of political parties can only be understood by recognizing that there are many varying and interwoven types of opinion, and a continual process of change from one to another.

Parties Before 1789.— During the colonial period there was no formal party organization in America; but there were political divisions corresponding roughly to the Whigs and Tories in Great Britain,— the Tories supporting the royal governors and the Whigs usually controlling the elective assemblies. Most of the Americans had been Whigs, standing for personal liberty and opposing centralized authority.

In the Revolution the Whigs became known as Patriots; while many of the business and propertied classes were Tories or Loyalists, supporting the British government. But after the establishment of independence the Loyalists disappeared.

A new division appeared in the Constitutional Convention of 1787, between the delegates from the large States who favored a strong national government, and those from the small States who preferred to continue a loose confederation. The result of this division was a series of compromises in the Constitution. In the campaign for the ratification of the Constitution, the supporters were known as Federalists, and the opponents as Anti-Federalists.

Federalists and Jeffersonian Republicans. — The new Constitution of the United States contained no recognition of political parties; and after it was adopted and put in operation there were for a time no clearly marked political divisions. Washington, and other leaders, were indeed strongly opposed to parties, and the new government included both Hamilton and Jefferson at the head of the two principal departments. But differences of opinion on questions of governmental policy soon developed the two opposing parties of Federalists and Republicans. The Federalists, under the leadership of Hamilton, and supported by Washington, at first controlled the central government, and favored strengthening the national authority, a strong executive and a liberal interpretation of the Constitution. More specifically they supported Hamilton's financial and commercial policy, and distrusting the excesses of the French Revolution favored neutrality in the war between France and Great Britain. The Republicans, under the lead of Jefferson and Madison, favored a strict construction of the Constitution, a limited scope of national authority and Congressional control of the government. The Federalists included most of the business and propertied classes; but the Republicans, organizing the small farmers and city workers, before long gained control of the national government. In power the Republicans became more national in spirit. When opportuntiy was offered, the Louisiana Purchase was made, in spite of its violation of the rule of strict construction. Later, under the aggressive leadership of Henry Clay, it entered on the War of 1812, which the surviving Federalists opposed.

After the war the Federalist party disappeared. The ensuing "era of good feeling" soon led to a period of personal politics, culminating in the Presidential campaign of 1824, in which there were four Republican candidates. Meanwhile the system of legislative and Congressional party caucuses, which had nominated candidates for executive offices, had grown into disfavor; and local and State nominating conventions had come into use.

Democrats and Whigs.— A new alignment of parties arose after the election of 1824, which continued through the second quarter of the century. One of these, under the name of Democrats, represented the more radical wing of Jeffersonian Republicans, and controlled the national government most of the time until 1860. Originating in personal loyalty to Jackson and a vague but pronounced feeling for a more democratic control of the government, which was strongest in the newer parts of the country, this party represented a strong national spirit, and in the case of Jackson there was in practice a vigorous exercise of executive leadership. But the policies of the party were affected by the traditional views in favor of strict construction, the limitation of the central government and emphasis on State's rights; and it opposed the national bank, protective tariffs and internal improvements. Later as the slavery question became more acute the State's rights doctrines of the party aligned it in opposition to attempts at national restriction of slavery.

In opposition there was organized a new National Republican party, which soon merged with other minor parties into the Whigs. Under the leadership of Clay and Webster, and supported by the financial and business classes, the Whigs revived and developed some of the nationalistic policies of the Federalists. They favored a liberal construction of the Constitution; and in particular supported the national bank, protective tariffs and the construction of internal improvements. At the same time, unlike the Federalists, the Whigs opposed executive dominance and favored Congressional control of the government. The Whigs were strongest in the Northeast; but had also a considerable support in the South. But while they had a larger popular following than the Federalists, they gained control of the national government only for brief intervals; and these temporary successes were secured by compromises inconsistent with the principles of their leaders. In the end the party failed as the result of an attempt to compromise on the slavery question.

During this period the machinery of party organization was more highly developed. The system of nominating conventions was firmly established, culminating in the national conventions for the nomination of Presidential candidates and the adoption of party platforms.

Minor Parties and Factions Before 1860.— From time to time minor parties and factional divisions of the leading parties have appeared in American politics; and some of these have played important parts in the evolution of the party system. Very ephemeral and unorganized factions were the Quids (Republicans opposed to Jefferson) and the Blue-Light Federalists (opponents of the War of 1812). The Anti-Masonic party also had a brief duration; but by holding the first public national nominating convention (1830) marked a significant stage in the development of party institutions. During the dominance of the Democrats, internal divisions arose, especially in New York State, such as Locofocos, the Hunkers and the Barnburners. Later the Whigs were divided between "Conscience" and "Cotton" Whigs and "Silver Grays."

Of more permanent influence were the anti-slavery parties. The early Abolitionists opposed political action. But the Liberty party nominated candidates in 1840 and 1844. In the next two Presidential campaigns the Free Soil party showed an increasing opposition to the extension of slavery.

Meanwhile opposition to the political influence of Roman Catholics and recent immigrants became a factor in local elections, and, aided by the disappearance of the Whigs, led to the organization of the American party, commonly called the "Know Nothings," which carried a number of States in 1854, and polled a considerable vote for its Presidential candidate in 1856. This party was soon absorbed by the new Republican party; although the surviving conservative Whigs formed the main support of the Constitutional Union party in 1860.

The Republicans to 1876.— Following the struggle over slavery in the regions acquired in the war with Mexico, which had resulted in the Compromise of 1850, the passage of the Kansas-Nebraska Act in 1854, reopening the question of slavery in those Territories, and involving the revocation of the Missouri Compromise of 1820, forced the slavery issue to the front and led to a radical party revolution. At the Congressional elections in 1854 a majority of "Anti-Nebraska" men were elected to the House of Representatives, under various party names; and these soon combined to form the new Republican party. This was composed of Free Soilers, most of the Northern Whigs, and Anti-Nebraska Democrats. While unsuccessful in 1856, it proved a strong opponent to the Democrats; and in 1860, with a divided opposition, the Republicans elected Lincoln as President.

The new party was at the same time more democratic and more strongly nationalistic than the former major parties. In opposing the extension of slavery, it asserted the power of Congress to exclude slaves from the Territories, against the opinion of the Supreme Court in the Dred Scot case. It also reaffirmed the Whig policies of a protective tariff and internal improvements, and added to these the enactment of a homestead law. With the secession of the Southern States, the work of first importance became the maintenance of the Union; and in this the Republicans received the support of many Democrats, although the conduct of the Civil War led to an enormous increase in the work of the national government and the executive.

After the war the Republicans continued in control of the national government through the period of reconstruction; and during this time the national authority was still further extended by the adoption of the 13th, 14th and 15th amendments to the Constitution. The Democratic party, almost silenced during the war, gradually regained control of the Southern and some Northern States; but the Republicans retained the popular support of patriotic feeling, combined with the aid of the manufacturing and capitalistic classes fostered by their economic policy, and a highly developed political organization.

Party Oscillations 1876–96.— After the reconstruction of the Southern States a new period of party history begins, marked by lack of clearly defined issues and oscillating party victories. The older issues were settled; but the Republican and Democratic party organization remained in existence. Criticism of political abuses under President Grant led to the abortive Liberal Republican movement of 1872; and in the reaction following the panic of 1873 the Democrats gained control of the House of Representatives. In 1876 the Republicans retained the Presidency through the findings of the Electoral Commission. The Democrats on several occasions were successful in the Congressional elections, and elected Cleveland as President in 1884 and 1892. But during the 20 years to 1896 no party controlled both the executive and legislative branches of the national government for more than two years at a time.

The most distinctive issue between the two parties was the tariff. The Republicans were definitely committed to a high protective policy, while the Democrats favored a reduction of rates and a revenue tariff. In their platforms

the Democrats maintained their traditional attitude toward economy and the limited exercise of governmental powers. The Republicans continued the policy of internal improvements.

But new questions were arising which gained support in both parties. Opposition to the corrupting influence of the spoils system led to the passage of the Civil Service Law in 1883. Agitation for government regulation of railroads led to State legislation and to the Interstate Commerce Law of 1887. Business depression and opposition to the financial interests led to demands for more and cheaper currency, which resulted in the passage of compromise measures of 1878 and 1890, and culminated in the cry for the "free coinage" of silver. The growth of monopolies led to the passage of anti-trust laws in the States and to the Sherman Law of 1890.

The general condition of political unrest was indicated by the appearance of a new series of minor parties. Beginning in 1872, the Prohibitionists have regularly nominated Presidential candidates, favoring the prohibition of the liquor traffic; but they have never polled a large vote. The Greenback party had candidates at each Presidential election from 1876 to 1884, supporting the issue of government paper currency. In 1888 there was a Union Labor party ticket. These two elements of rural and urban labor discontent were combined in 1890 in the Populist party, which polled more than a million votes in 1892. This party supported the "free coinage" of silver, postal savings banks, a graduated income tax; government railroads, telegraphs and telephones; and the transfer of unused land to actual settlers. Even more radical measures were advocated by the Socialist Labor party which also had candidates in 1892.

Republican Control from 1896 to 1912.— The Presidential election of 1896 brought about an important readjustment of party lines, which ushered in another period of 16 years continuous Republican control of the national government. The Democratic National Convention of 1896, controlled by the radical wing, adopted a platform in favor of the free coinage of silver and nominated for President W. J. Bryan. This brought to their support the Populists and silver Republicans; but lost the conservative gold standard Democrats in the East. The Republicans, reaffirming their protective tariff views, now took a positive position in favor of "sound money"; and with the support of the business interests elected McKinley and controlled both houses of Congress.

As a result of the brief war with Spain, the United States acquired island possessions in both the West and East Indies and became actively involved in world politics. The Republicans supported this policy of expansion; while the Democrats opposed the militaristic and imperialistic tendencies, but without success.

The assassination of McKinley in 1901 and the succession of Roosevelt to the Presidency led to important changes in party policies. Roosevelt was an aggressive leader, who upheld the new military and international policies and acquiesced in the traditional protective tariff policy of the party, but who favored a considerable increase of social and industrial control by the government, which was opposed by the conservative business elements. At the election of 1904 the Democrats nominated a conservative candidate; but Roosevelt received a large support from the more radical Democrats and was triumphantly re-elected. During his second term important laws were passed for the regulation of railroad rates, the government inspection of foods and some supervision of large industrial corporations. Largely through the influence of Roosevelt, the Republicans in 1908 nominated and elected as his successor W. H. Taft, over Bryan, who had been nominated by the Democrats for the third time.

President Taft proved much more moderate than Roosevelt; and during his administration the Republicans became badly divided. A revision of the tariff was enacted; but this was not satisfactory to the more progressive Republicans. This dissatisfaction, with the growing demand for other political, social and industrial reforms, was reflected in the defeat of the Republicans by the Democrats at the Congressional elections of 1910. Another sign was the increasing vote of the Social Democratic party which had entered the political field in 1900.

The Progressives and the Wilson Democracy.— In 1912 came another crisis in party history, resulting in a change in party control of the national government. For many years the traditional policies of the two leading parties had been of little significance; and each of these parties had a conservative and a progressive or radical wing. Progressive Democrats and Republicans had carried through important economic and sound reforms in many States — in taxation, control of business, the direct primary and the initiative and referendum — and some of the new leaders were in Congress. The national nominating conventions of both major parties in 1912 saw a prolonged struggle for control. In the Republican convention, the conservatives supported the renomination of President Taft, and by their control of the party machinery were able to win a formal victory. But most of the progressive Republicans who had favored another nomination for Roosevelt claimed that he had been defeated by fraud, and took the lead in organizing a new Progressive party which nominated Roosevelt on a platform supporting radical reforms in the interest of greater political and social democracy, and a more active national government. In the Democratic convention, under the leadership of Bryan, the progressive element nominated for President Governor Wilson of New Jersey, on a less radical platform than that of the Progressives. Wilson received the support of some progressive Republicans and many moderate independents, and was elected, carrying most of the States and electoral votes, although with less than a majority of the popular vote. Roosevelt received a larger vote than Taft.

The first term of President Wilson was marked by the passage of many important laws, — revising the tariff downward, reorganizing the banking system, controlling industrial monopolies, as well as some social welfare legislation. Under recent amendments to the Constitution a national income tax has been established, United States senators are now

elected by popular vote and prohibition of the liquor traffic has been adopted. A woman suffrage amendment has been proposed. On the outbreak of the Great War Wilson adopted a policy of neutrality, which he maintained through his first term, and in 1916 again led his party to victory.

The entrance of the United States into the war against Germany, in 1917, led to another enormous increase in the work and influence of the national government. The peace treaty and the League of Nations involve a more active participation by the United States in world politics. In assuming these responsibilities the Wilson democracy is departing further from the traditions of the older Democratic party. What the result will be in the future history of political parties in the United States remains to be seen.

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59. FOREIGN POLICY. The diplomacy, negotiations and treaties of the United States since the beginning of the national government in 1775 are connected with more than 50 foreign governments, cover a period of over 140 years and apply to a great number of subjects. To analyze the national policy either by topics or by the governments concerned would require a volume. On the other hand, an historical survey of the successive epochs and episodes of American diplomacy may be brought into moderate space, because the main lines of policy have been simple and easy to trace.

Diplomatic Procedure.— From 1775 to 1789 Congress, as the mainspring of government, was the source of all diplomatic authority, the framer of instructions and the maker of treaties. During the Revolution, Congress commissioned foreign ministers to most of the Continental great powers and they were formally received by France and Holland. After the peace, Prussia, Sweden and Great Britain entered into diplomatic relations; and in course of time all the other European states sent ministers.

Under the Federal Constitution, the power to appoint ministers and ratify treaties was placed in the hands of the President with the advice and consent of the Senate; and the commissions, correspondence and instructions all proceeded from the President or the Secretary of State, who was practically subject to his direction. From 1797 to 1829, each of the five successive Presidents came into office with large diplomatic experience. Almost all the envoys also were men of public responsibility, trained for their duties.

Since Jackson's time, both Presidents and Secretaries of State have frequently been men of small experience outside the boundaries of their own country, and sometimes of little previous public service at home. Presidents Polk, Lincoln, Grant, Cleveland, McKinley and Wilson had no previous knowledge of courts, and with one or two exceptions had hardly been out of their own country. Such secretaries as Van Buren, Webster, Buchanan, Blaine and Hay were trained statesmen; others came into office little known even to their own countrymen.

Most appointments to foreign missions were made from a class of well-to-do gentlemen who were novices in politics, or from literary men, such as Washington Irving, James Russell Lowell and John Hay. The policy of each successive administration was to carry on its relations with other countries through men of natural force of character and sagacity who knew little of diplomatic usages. Nevertheless the diplomacy of the United States has always had the advantages of directness, vigor and freedom from the complications and intrigues of European diplomacy.

Independence and Territory (1775–89).— The first diplomatic object of the Continental Congress was to make friends abroad, who would aid the infant United States against Great Britain. The treaties with France in 1778 were contrary to all the previous traditions of the colonies and brought about the only military alliance between the United States and any foreign power, before 1917.

The practical effect was to incline England to agree to the favorable terms of peace negotiated in Paris in 1782. With great skill and pertinacity, the American envoys secured an agreement that independence should be admitted before any other conditions were made — not as a gift or a makeweight but as a recognition of a political and international fact.

Another success was the adjustment of boundaries. Our envoys obtained from Great Britain an acknowledgment of territory which doubled the area of the 13 former colonies and prepared the way for an empire in the West. Canada, for which the United States at one time hoped, was not included; but in the Northwest and Southwest, Great Britain withdrew all claims and the Mississippi became the boundary.

Early Expansion (1803–19).— The bounds of the treaty of 1782 excluded the United States from the natural outlet of the Great Lakes; but the Erie Canal and the trunk railroad lines later made good that defect. The United States was also left with no frontage on the Gulf of Mexico. That made it an essential American policy to secure the strip of Spanish territory which shut them off from tide-water on the south. A lucky chance, of which President Jefferson skilfully took advantage, made it possible to annex the lower Mississippi in 1803, and with it the whole western part of Louisiana extending far into the Rocky Mountains. This gave a narrow approach to the

Gulf, which was broadened by the forcible occupation of West Florida (1810–13) and by the annexation of East Florida in 1819. On the northwest, the discovery of the Columbia River (1792), the exploration of Lewis and Clark (1806) and the founding of the post of Astoria (1811) laid the foundations for an extension of territory to the Pacific.

Neutral Trade (1789–1815).— The United States was the first American state; it set up a new force in the world and opened a new kind of international relations. When, in 1793, revolution and war came upon Europe and lasted with little interruption for 22 years, there was great danger that the United States would be swept from its moorings and drawn into the influence of one or the other of the two warring groups, of which Great Britain and France were the leaders.

In view of this danger, Washington, John Adams, Jefferson and other statesmen advised a "Policy of Isolation" on the ground that the United States was not primarily interested in European controversies and wars and, therefore, should remain neutral. After reaching the verge of war with Great Britain in 1794 on questions of neutral trade and impressment, and actually engaging in naval war with France in 1798, the country settled down to a policy of keeping out of hostilities and enjoying trade with both groups of powers in Europe.

This was always difficult because of the determination of both sides to seize American ships and cargoes on novel and often illegal applications of the international law of contraband, blockade, free ships and colonial trade ("Rule of 1756"). Some of these difficulties were covered by the Jay Treaty of 1794, which was allowed to expire in 1807. The Barbary wars somewhat diverted public attention for a few years (1801–05); but the breaking out of a new European war in 1803 led to fresh captures of American vessels and to renewed impressment of American seamen by the British.

The disregard to neutral rights reached its height in the attempt of Napoleon to found a "Continental System," intended to cut off all the commercial intercourse of Great Britain. This led to the British Orders in Council and French decrees, which perhaps suggested similar acts of the British and German governments in the European War of 1914. The diplomatic protests of the Americans were disregarded; and since the United States had no military or naval force able to protect its commerce, there was nothing for it but Jefferson's policy of commercial restrictions. This took various forms such as non-intercourse, non-importation and non-exportation, which last was carried out by the Embargo Act of 1807.

This method, which was substantially a boycott, came near success; but in the end was ignored by both the belligerents. The interference with neutral trade, combined with impressments and some minor grievances, eventually led to the War of 1812, in which the American cruisers and privateers captured 1,800 British ships. The territorial motive also came in; the United States confidently expected to conquer Canada; but no territory was added and several areas of the United States fell for the time into the hands of the enemy.

However, the naval prowess of the American ships of war and privateers made such an impression on the British mind that a favorable peace was obtained at Ghent in 1814. No agreement was reached either as to neutral trade or impressments; but the European strife was ended and both those questions were shelved. In course of time the United States secured considerable money payments from France and other European powers for illegal captures during the Napoleonic wars.

Latin-American Policy (1815–26).— During the period just discussed, a new group of nations was growing up in the Spanish-American Empire. The LaPlata colony made itself practically independent in 1807 and there were risings elsewhere. Soon after the restoration of the Bourbon monarchy to Spain (1814) the flame of rebellion ran through the whole Spanish continental area, except the islands of Cuba and Porto Rico. By 1821 independent governments were set up in Chile, Peru, what is now Colombia, Central America and Mexico, besides the empire of Brazil, previously a Portuguese colony.

The natural policy of the United States toward these new neighbors was one of sympathy with rising republics, and friendship with powers which opened new fields of commerce. The sudden appearance of these new planets in the political solar system disturbed Europe, which after Napoleon's fall was organized in the so-called Holy Alliance. That combination of powers put down a revolution in Spain and seemed on the brink of sending a French expedition to overcome the new American states, when (December 1823) President Monroe made public his famous Doctrine.

The Monroe Doctrine was a protest against any action by European powers which would extend their "Political System" to the new world. This utterance was founded on a new principle, the converse of the Policy of Isolation. Monroe held that the eastern and western hemispheres were politically separated: the United States did not meddle in European affairs, and European powers must not meddle in American affairs. Still deeper lay the belief that European interference anywhere in South America might create centres of influence which would in the long run be dangerous to the United States.

The proposed joint action of Europe in America was at once given up; but the interest of the United States in Latin America for nearly a hundred years has been one of the most significant factors in our foreign policy. An effort was made in the Panama Congress (1826) to bring the American nations together; but it was a part of the policy of the United States not to commit itself to the leadership or defense of the neighboring powers.

Western Expansion (1819–60).— The Monroe Doctrine was not meant to be a self-denying principle which would prevent annexation. Immediately after the War of 1812 the United States began to push with all its might toward the Southwest and Far West. In the treaty of 1819 for the cession of East Florida, Secretary John Quincy Adams secured from Spain a withdrawal of all claims on Pacific Coast territory north of the 42d parallel. As a counterweight he consented to the line of the Sabine River as our southwest boundary. A movement of Americans into the Mexican province of Texas at once began, which in

1835 made that region an independent country, which at once sought admission into the United States.

This left the government face to face with Great Britain as the only other claimant to the immense Oregon country. A long-standing controversy with the British government over the Maine boundary was settled by a reasonable compromise in 1842. The Oregon question then became threatening; after much discussion it was settled in 1846 by running the compromise line of the 49th parallel from the Rocky Mountains to the Gulf of Georgia, and thence through the straits of San Juan De Fuca to the Pacific Ocean.

This settlement of the Oregon question brought into sharper relief the future of California, toward which President Polk bent his energies. In 1845 Texas was annexed as a State of the Union. In 1846 the United States declared war on Mexico and conquered, and occupied both California and New Mexico, which was the land bridge across the continent. Vain attempts were made by President Pierce and President Buchanan from 1854 to 1859 to annex Cuba, part of Central America and more of Mexico. The only action taken was the treaty of 1846 with New Granada and the Clayton-Bulwer Treaty with Great Britain in 1850, by which the United States assumed a special interest and responsibility for a future Isthmian Canal.

Civil War Diplomacy (1861–72).— During the Civil War the prime policy of the United States was to insist that the Southern Confederacy could never achieve independence, and that, therefore, any recognition of independence or any military or naval aid would be an affront to the United States. The old question of neutral trade came up in a new guise, when the United States blockaded most of the Confederate coast and freely captured cargoes of contraband. This involved a novel doctrine of continuous voyages, to the effect that cargoes and even vessels bound for Europe to a British or Spanish colonial port, thence to be reshipped to the Confederacy, could be captured in either stage of that transportation. Great Britain raised no objection to this doctrine. The United States violently protested against the fitting out of ships-of-war in neutral ports, especially the cruiser *Alabama*, which was built in an English shipyard.

After the war was over, the "Alabama claims" for damages caused by such cruisers almost led to a breach with England. It was finally healed by the Treaty of Washington of 1871, in which Great Britain agreed to a set of rules which were practically a disavowal of the acts complained of. On this understanding the two countries went into the nominal arbitration of Geneva in 1872; and the arbitral commission found Great Britain liable to the amount of $15,500,000.

The Canal and Immigration (1861–81).— Before the war ended, the United States, under the skilful guidance of Secretary Seward, was laying the foundations of a new and positive policy in Central America and the West Indies. In 1864 a treaty was negotiated with Honduras, giving special canal rights to the United States. In 1867 Seward took advantage of the proposition by Russia to cede Alaska for a moderate payment. He turned his attention also to the Caribbean region, negotiated an unsuccessful treaty for the Danish Islands and another for Santo Domingo. This latter project was renewed and strongly urged by President Grant, who could not induce the Senate to approve it. The Cuban Revolution, from 1868 to 1878, deeply interested the United States; and toward the end a proposition was made to European powers to unite in stopping the war and relieving Cuba.

Meanwhile the introduction of general military service into Germany raised new international questions about the status of immigrants. Congress took the broad ground (1868) that "The right of expatriation is a natural and inherent right of all people," thus asserting that all foreigners had a presumptive right to come to the United States and acquire citizenship. Nevertheless the same year a treaty was made with Germany, admitting that under some circumstances a naturalized citizen might lose that status.

The question of the right of immigration was raised in a different way by the increase of Chinese immigration under a treaty of 1868. Congress passed several bills denying the privilege to Chinese, and popular feeling pushed through statutes prohibiting the immigration of any Chinese laborers. See CHINESE IMMIGRATION.

The Latin-American question entered on a new phase when in 1879 a French company prepared to construct a canal across the Isthmus of Panama. In spite of protests by President Hayes, who declared that any such canal must be "a part of the coastline of the United States," Congress and the people could not be aroused. In 1881 Secretary Blaine tried hard to get rid of the Clayton-Bulwer Treaty, so as to give the United States a free hand in dealing with the canal question; and he also made great efforts to put an end to the wars between the South American states and to bring all the American nations together in harmony and perhaps in some form of union.

Expansion Policy (1895–1904).—For nearly 15 years after 1881 no serious diplomatic crisis arose and no new policies were adopted, except a series of Pan-American issues, beginning in 1890. In 1895 a dispute between Great Britain and Venezuela as to the proper boundaries of British Guiana suddenly drew from President Cleveland a new statement of the Monroe Doctrine, in which he denied the right of European nations to hold colonies in the Americas and declared that "to-day the United States is practically sovereign on this continent, and its fiat is law," ending with a threat of war. Great Britain, convinced that the American people were behind the President, gave way and agreed to arbitrate the question, and from that time on sought the good will and friendship of the United States.

This friendship was shown in the Spanish War of 1898. Cuba had long been a source of trouble between the United States and Spain, and annexation had been predicted for many years. The Spanish government was weak and overbearing; the American people as usual sympathized with the effort to set up a republic. There seemed no end to the Civil War that began in 1895. Hence in 1898 Congress took

the momentous decision to intervene by force, adding the Teller resolution, which denied any "intention to exercise sovereignty, jurisdiction or control over said island except for the pacification thereof."

This little war brought about a change in foreign policy unexpected by the country. Not only was Cuba occupied, but the neighboring island of Porto Rico was conquered almost without a blow. On the other side of the world the city of Manila and eventually the whole archipelago of the Philippine Islands were occupied by American forces. Guam, Tutuila and other Pacific islands were added. The Hawaiian Islands were annexed. Thus the United States became a Caribbean power, a Pacific power, an Asiatic power and a colonial power. In 1900 a detachment of United States troops was part of the force which marched up to Peking and released the Ambassadors to China.

As soon as the war was over President Roosevelt entered on a new and vigorous canal policy. The Clayton-Bulwer Treaty was released by Great Britain, and preparations were made to buy out the unsuccessful French canal company. An attempt was made to negotiate a treaty for canal rights with Colombia (1903). When that treaty was rejected by Colombia the province of Panama revolted, and its independence was at once recognized by the Roosevelt administration. A treaty with the new republic was concluded for the virtual cession of a canal strip. Next year work began on the canal and in 1914 it was opened to traffic, under the exclusive ownership and authority of the United States government.

The growing consciousness that the United States was a populous, rich and potentially strong nation, one of the first-class powers in the world, was shown in 1902 when a German fleet was sent to enforce payment of certain claims. President Roosevelt appealed to the Monroe Doctrine and insisted that Germany should give a pledge not to seize or even to land upon Venezuelan territory.

World Power Policy (1905–14).— Another period of about 10 years passed without a development of new principles. The United States was busy taking care of its colonies in the Philippines and Porto Rico and its dependency of Cuba. The Venezuela episode brought out the fact that the Monroe Doctrine could be invoked to protect a country from aggression from overseas; but what should be done in case of a real injury to a European country? To meet this difficulty President Roosevelt announced as a new form of the Monroe Doctrine the policy of "The Big Stick," as it was commonly called; that is, he promised to keep unruly American powers in order, so as to take away the excuse for foreign interventions.

Hence he took charge of Santo Domingo in 1905; and Panama became practically an American dependency. Under President Wilson Nicaragua and Haiti were brought under the control of the United States and the Danish Islands were annexed in 1917. At the same time the government assumed a responsibility for Mexico such as would prevent foreign powers intervening there. It thus became the policy of the United States to occupy the Caribbean and exercise a dominant influence in all the neighboring coast of North America.

Another evidence of a new spirit was the active part taken by delegates of the United States in The Hague conventions of 1899 and 1907. The general influence of our government was toward world peace, though our representatives were careful to give notice that we did not consider the Monroe Doctrine to be in any way set aside by The Hague conventions. In all parts of the world American commerce was pushed, American influence was felt and American diplomats were consulted. The United States took especially strong ground for China against the oppression or looting of that country by other powers.

Policy in the World War (1914–19).—The outbreak of war in Europe in 1914 put the diplomatic policies of the United States to many severe tests. In the first place it was contrary to the genuine love of peace and desire to advance peace which has characterized the American people and government. From the American point of view, every war of the United States since the Mexican War has been simply an effort to put things into a condition where permanent peace was possible. The Civil War, the frontier Indian wars, the Spanish War and the military occupation of the little Latin-American countries were all intended to lead to an enduring peace in America.

The policy of neutrality was hard either to define or to maintain, because of the naturalized or unnaturalized sons of the various warring countries who were living in the United States and who naturally felt a strong desire that their native countries should be successful. The status of neutral trade was especially difficult, because the principles of international law recognized by the United States and applied during our Civil War permitted the capture of any vessel carrying contraband to a belligerent port, and to a vessel with any cargo bound for a really blockaded port. Hence losses of American cargoes and vessels were inevitable.

This tension was much increased by the allied enlargement of contraband, first to cover such articles as rubber, copper and steel which had come to be essential for carrying on more. Then food stuffs, always a debatable point, were added; then nearly everything that could be useful or comforting to the army or the general population. A further complication was the insistence of Great Britain that cargoes bound to neutral ports could be seized, if there was a strong likelihood that part of them would find their way to Germany. This still further limited the markets and the sales of American business men.

It had been the practice of the world to buy munitions of war freely in any available market while the war was going on; but the control of the sea by Great Britain prevented shipments to the Central Powers and they protested that it was unneutral for the United States to allow shipments to their enemies. Then came drastic orders from both sides, declaring considerable areas of the open sea to be fields of war, in which any vessel, neutral or otherwise, might be sunk at sight. One result was the destruction of the steamer *Lusitania* by a German submarine without warning (May 1915), with a loss of more than 100 American

lives. This warfare of furious orders culminated in the German announcement of February 1917 that any vessel found approaching or leaving the British islands was liable to be sunk without warning. The United States thereupon suspended diplomatic intercourse and the controversy all but led to war.

The effect of this confusion and danger upon American foreign policy was to convince the country that the peace and the freedom of the seas, which was so dear to Americans, could only be made safe by a sufficient military and naval force to give weight to the remonstrances and demands of the United States.

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60. THE UNITED STATES AND THE EUROPEAN WAR. When the war broke out in the summer of 1914, the American people were amazed and surprised; there were, of course, differences of interest and attention, some persons at once taking acute and absorbing interest, while others passed the whole thing by with a shrug of the shoulders as something essentially without moment to their own country. It naturally took time, and considerable time, for the great body of the people to understand the war; indeed, the number understanding it at the beginning was very small. The history of the development of intelligent interest and of responsibility, as well as the growing realization that the conflict was our own or would become so, is a history of very great significance and importance. No one can, however, write that history with perfect assurance that he grasps the truth at every point, because it is fundamentally a history dealing with public psychology and is at the best intangible. The main features of the story can, however, be given with some degree of confidence.

There are obvious reasons for the absence of absorbing interest and understanding at the beginning. Few persons understood European conditions, few realized that Europe had been living with a powder magazine for decades because there were the vast armies and navies and mutual suspicions and race rivalries and various other conditions that might in a twinkling set the continent ablaze. The whole militaristic make-up and spirit of Germany, if known at all, appeared unreal and too much out of harmony with life, as Americans knew life, to be taken over-seriously. Furthermore, partly because of the activity of peace organizations, it looked as if the cause of peace were rapidly growing and as if war was too plainly destructive and foolish to be feared in the modern world. Financial, economic and trade conditions binding modern nations together seemed too strong to be lightly broken even if they did not make war impossible.

There was, early in the war and even before we were directly affected, more intense interest in the East than in the country west of the Appalachians, at least such appeared to be the fact, and interest and attention gradually diminished toward the West. This fact is easily explicable, although just how much weight should be thrown upon it one cannot say. To the extent that this difference existed, it can be explained by calling to mind the simple fact of distance which always affects our feelings. It was inevitably difficult for the dweller in the Mississippi Valley to comprehend the reality of a struggle which was so distant and so out of keeping with the daily life about him. No one would dare to say just how large was the proportion of the people, East or West, who in the early days sympathized with the Allies. There is certainly no ground for complaining because men did not decide before they knew the facts; but it is safe to say that the invasion of Belgium and the story of the "scrap of paper," Germany's readiness to throw into the waste basket the most explicit provision for the maintenance of Belgium neutrality, awakened resentment, even if in a mild form, almost at once. There was, however, at the beginning practically no demand that the American government should publicly protest against the violation of Belgium, though demands of that kind were occasionally heard as the months went by. For an appreciable time, too, there was little public excitement about the German atrocities in Belgium. Many put the stories down either as gross exaggeration or as the lamentable but customary accompaniments of war, and so it may be said that the winter of 1915 was well along before there came an appreciation of the enormity of the German offenses against the unhappy civilians of Belgium. Even then, the knowledge on which judgment could be based was probably confined largely to those having the opportunity to read official reports and tales of apparently undoubted reliability. Some persons — perhaps, in the aggregate, many persons — were affected and dulled in their belief by the constant assertion of German sympathizers that all stories of German conduct, save those of simple rectitude, were made in Great Britain. Still, it is probably true that the great majority were not materially misled by the German propagandists.

All through those trying months and especially up to the time of the *Lusitania* sinking in May 1915 there was effort among the people at large to be neutral or inoffensive in their expression of sympathy for the Allied cause. Doubtless a portion of this inoffensiveness was lethargy; but even those hoping strongly for the defeat of Germany refrained generally, though not universally, from public denunciation of Germany's conduct in beginning the war and of her method of carrying it on. Defenders of Germany, on the other hand, often quite open in their pronouncements, had every

opportunity of free statement. Opponents of Germany, it is true, were by no means all silent; books were written and editorials in the newspapers were printed which discussed the evidence of Germany's guilt, but in the opinion of the writer of the present article, the outstanding fact is the hesitation of the people generally, even those feeling strongly in sympathy with the Allied cause, to indulge in heated declamation or to embarrass the government which had issued a proclamation of neutrality and was seeking to play the part of a neutral honestly and not merely ostensibly. Of course as the months went by expressions of opinion were stronger and more openly made. It is naturally impossible to say how much of the growing opposition to Germany was due to developing appreciation of her guilt in beginning the war and carrying it on with a ferocity which astounded the world, and how much was due to interference with American rights on the seas and to the rising appreciation of a German menace to our own peace and safety; but mere fear of German ambition probably played no very large part, it may be not so large a part as it should have done, in arousing American antagonism.

Before taking up other aspects of the case it is well to remind the reader that there were various things occupying the minds of the American people besides the war in Europe. Prominent among them was the trouble with Mexico. It was not at all sure that we should not be driven into a conflict with that country and it must also be remembered that the danger continued down almost to the time of our taking up arms against Germany. An entirely wrong perspective is gained if these various distractions are overlooked; without some appreciation of the reality of internal problems and of the Mexican and Caribbean difficulties and responsibilities, one might gather the opinion that our minds were wholly taken up with purely humdrum domestic toil or with watching the conflict in Europe as more or less interested spectators. It is also well to remind ourselves that, during a good portion of the time we are discussing, i.e., the two years and a half between the outbreak of the war and the breaking off diplomatic relations with Germany (August 1914 to February 1917), our State Department was in part employed in discussing with the British Foreign Office various troublesome questions arising from Britain's sea policy. It is impossible to do more here than hint at these discussions, for the whole matter is complicated and inextricably connected with the whole diplomacy of the war. We may say in a word that the discussion practically began over Britain's control, especially in the North Sea, where it was said Germany had scattered contact mines. As the months went by, arguments turned on the right asserted by the British government of seizing contraband destined ultimately to Germany though bound first to a neutral European country, and on taking American ships into British harbors for examination instead of making the search for contraband at sea. The British replies to our various protests were able and in the best of temper and there was little, if there was any, evidence of a desire to banish international law altogether under the plea of necessity, a plea which the German government was quite ready to indulge in.

In January 1915 the German government took control of the corn, wheat and flour in Germany and it was henceforward difficult for neutrals to maintain that provisions evidently intended for Germany were not absolute contraband and liable to seizure. No one reading the documents with a fair mind will fail to see the inherent perplexities of the problem and that the United States, with no apparent intent of doing aught but preserve rights of neutrals on the seas, stated the case against Great Britain with at least sufficient directness and plainness. The subject is one that may still vex the brains of international lawyers; but the unlearned in the law will not detect a readiness on the part of the American government to wink at British transgressions and denounce German wrongdoing, and he will not detect that British conduct is in the same category with German frightfulness and disregard of ordinary principles of law and the claims of humanity for consideration.

Though such subjects as those just mentioned continued to be subjects of diplomatic discussions for many months, they sank into comparative unimportance upon the inauguration by Germany of a plan of terrorizing on the high seas. As early as December 1914 Admiral von Tirpitz was quoted as intimating that a war of submarines on British merchantmen was impending. On 4 February the German government proclaimed the waters around Britain a "zone of war" and announced the intention of destroying ships found there "even if it may not be possible always to save their crews and passengers." That was the beginning of Germany's piratical policy which finally made nearly the whole of the civilized world her enemies; no wonder it had that effect, for she defied the world. The American government answered the war zone proclamation by solemnly warning the German government that it would be held to strict accountability. It is not the purpose of this article to outline the diplomatic controversy with Germany, but we must point out that the President exhibited great patience, seemingly intent upon saving international law and defending if he could American and general neutral right to safety on the sea. There were many, though probably by no means the majority of the people, that thought he should stop writing notes and should prepare for war. The great crisis came with the sinking of the *Lusitania* (7 May 1915) when over eleven hundred persons were drowned, including 124 American men, women and children. That was bringing German practice of frightfulness near home and a wave of indignation swept over the country. Germany could not plead that the sinking was an accident, and, though she expressed "deepest sympathy," put the blame on Great Britain. The American people will not forget in this generation the brutality of a deliberately planned attack on a passenger ship. The sinking of the ship brought a sharp note from our government in which the German government was informed that we should not omit any word or act necessary to the sacred duty of maintaining the rights of our citizens. Other disasters and lawless attacks followed and other notes were issued in the course of

that year; but still it is not within the power of the present writer to say that the bulk of the American people were ready to go to war. As the months went by, there were doubtless gradual education and gradual appreciation of the deeper significance of German assault upon international law and upon the ordinary claims of humanity, and there was a growing conviction of the menace to civilization in a power which stopped at nothing to win. We may, therefore, pass over the succeeding months in which Germany gave new proofs of the character of her government and her military leaders and aroused in the American mind the confirmed belief that if the world was to be a decent place to live in the military clique of Germany must be beaten and beaten badly at their own chosen game of war. Though there were many other causes for anxiety or for actual war, we may now mention only one — the sinking of the *Sussex* in the spring of 1916, in which Americans lost their lives. The promise wrung by President Wilson from the German government to observe at least some measure of respect for human life in her barbarous submarine policy was openly cast aside in January 1917 and diplomatic relations with Germany were broken off. War seemed inevitable and though we tried arming our merchantmen and still hesitated to take the plunge, the President finally went to Congress with a war message on 2 April 1917.

During the course of the war and before our entrance, the American people had opportunity to get acquainted in some manner with German *Politik* by seeing something of the activities of the German spies and the machinations of German agents in flagrant disregard of our laws to maintain our legal position as a neutral. Naturally this whole matter is still shrouded in partial darkness, but the revelations, especially in 1916, increased the growing indignation of the nation. The conclusive evidence in some cases was missing, while in others court trials were confirmatory of the existence of a system of intrigue which was exceedingly objectionable and which tended to increase dislike of Germany and her works. The later revelations justified and more than justified the suspicions and rumors that were spread about before we entered the war. The seizure of the von Igel papers in New York in the spring of 1916 brought to light evidence of a conclusive character of highly-developed plans and practices of the most reprehensible character. Not until we entered the war were the people generally aware how fully the German embassy itself had made use of the hospitality of this country to indulge in entirely illegal and wholly unjustifiable not to say criminal practices. Long before the German Ambassador von Bernstorff was given his passports (3 Feb. 1917) the activities of the Austrian Ambassador were detected and his recall was demanded. These occurrences and the awakened suspicion and the thoroughly justifiable resentment account in part for the growing belief that the maintenance of peace was incompatible with American honor and self-respect and that the place of the United States was by the side of other democracies in a war against brutal warfare and shameless intrigue. We came to see that democracy could not be safe in the presence of autocratic might aided by autocratic stealth.

Meanwhile there was much discussion on the subject of preparation for war or at least adequate provision for defense. Some there were that believed early in the war that our government should make extensive preparations; others thought that even at such a time, and perhaps especially at such a time, when Europe was drenched with blood in a war brought on despite great armies and caused, in part, by the maintenance of vast military establishments, the duty of the United States was not to display threatening military power. Others of course were merely uninterested, but it was hard to convince the ordinary citizens either of immediate danger or that big armies made peace secure. In May 1915 President Wilson in a speech at Philadelphia said, "The example of America must be a special example; the example of America must be the example not merely of peace because it will not fight, but of peace because peace is the healing and elevating influence of the world; and strife is not. There is also such a thing as a man being too proud to fight; there is such a thing as a nation being so right that it does not need to convince others by force that it is right." The too-proud-to-fight expression was immediately seized upon in some quarters as highly reprehensible. In the course of the succeeding months the President spoke plainly of American danger and of the necessity of making preparation for conflict. In January 1916 he declared that the American people "are ready at any time to fight for the vindication of their character and their honor. They will at no time seek a contest, but they will at no time cravenly avoid it." Soon after this he declared that the country must prepare effectively and promptly and that not a day must be lost. In the spring months of 1916 a wave of "preparedness" swept the country; it may be more accurate to say that there were parades and speeches, for no one can be sure just how thoroughly the people were convinced of the necessity for putting the country in a position for defensive war. The National Defense Act (approved 3 June 1916) provided for a somewhat elaborate military organization. It authorized a regular army of not to exceed 175,000 men, excluding the Philippine scouts, the enlisted men of the Quartermasters corps of the Medical Department and the Signal corps. Provisions were made for the Officers Reserve corps, for a Reserve Officers Training corps and for the building up of the national guard. The appropriation for the army totaled $267,596,530.10. This was by no means satisfactory to some persons, however, for they asked for nothing less than universal military training. The naval program adopted in Congress in 1916 provided for a large increase in the navy; and an appropriation of $313,300,555 was made, as compared with less than half that sum appropriated for the preceding year. The three-year building plan involved the construction of over 150 ships, 10 of them battleships and 50 destroyers.

As has been said earlier in this article, not all elements of the people were eager to prepare for war. Especially during the earlier portion of the period under review, there were many expressions of opposition to the war spirit and even to building up the army and navy. The Women's Peace party was outspoken in its advocacy of peace and 40 delegates went

from this country to the International Congress of Women at The Hague in April 1915. The Henry Ford Peace Expedition left this country in December of that year with the intention of putting an end to hostilities and accomplished nothing. The Carnegie Endowment for International Peace devoted its energies partly to the publication of important documents on international affairs and took up various activities of a useful but uncontroversial character. The old American Peace Society was reorganized in 1916 and did a good deal in the way of distributing material. In addition the American Union against Militarism and various other organizations came into existence. The most powerful organization connected with the movement for the maintenance of peaceful relations in the world was the League to Enforce Peace; its purpose, however, was not to bring about a conclusion of the existing war, but rather to promote and if possible secure the establishment of a system for assurance of lasting peace. The organization, taking its beginnings at a conference early in 1915, was formally founded in June of that year. The idea that there should be an international body, which should have the authority and the power to compel a public investigation of controversies and differences before nations plunged into war, attracted wide interest. In the spring of 1916 President Wilson declared the readiness of the United States to become a partner in any feasible association of nations and at various other times gave clear indication of his sympathy with the principle. In October he said that the business of neutrality was over; "Not because," he said, "I want it to be over, but I mean this, that war now has such a scale that the position of neutrals sooner or later becomes intolerable." The Republican platform of that year declared for the "pacific settlement of international disputes and the establishing of a world court for that purpose," and Mr. Hughes in his speech of acceptance advocated international organization for international justice and to safeguard world peace. The Democratic platform contained a declaration that the world has a right to be free from every disturbance "that has its origin in aggression or in disregard of rights of people and of nations," and that it was "the duty of the United States to join in any feasible association to that end."

In the early part of 1917 President Wilson in a speech to the Senate discussed fully the general problem of world peace, which must be a peace worth keeping, "a peace that will win the approval of mankind, not merely a peace that will serve the several interests and immediate aims of the nations engaged." He declared it inconceivable that the people of the United States should play no part in the establishment of a stable peace and that "no covenant of co-operative peace that does not include the peoples of the New World can suffice to keep the future safe against war." Thus, as far as the President, party platforms and the statements of party candidates could commit the nation, not to speak of many other announcements of opinion, the United States was committed before it entered the war, not only to peace as opposed to war for the basis of human progress, but to an abandonment of isolation and a readiness to enter into international organization to make secure the peace of the world. The nation could and did, therefore, take up arms in April 1917 not merely to help in punishing Germany for insult and unspeakable wrong, but for better conditions in the world and for lasting peace based on justice.

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UNITED STATES, Forestry in. See FORESTRY IN THE UNITED STATES.

UNITED STATES, Painters of. This subject receives special detailed treatment in the articles on American Lanscape Painting and Painting in the United States. For further information the reader is directed to the biographical sketches on the foremost artists of America scattered through the several volumes of this Encyclopedia. See AMERICAN LANDSCAPE PAINTING; PAINTING IN THE UNITED STATES.

UNITED STATES, Presidents and Vice-Presidents of the. In the following tables the important facts concerning the various Presidents of the United States have been condensed for convenient reference. The first table gives the place of birth of each President and, if a college man, the name of the college which graduated him. The second table gives the vocations of the Presidents and the length of service of each and the third table gives the cause of death and the place of their burial. The fourth table gives the place of birth and the length of service of each Vice-President. See PRESIDENTS OF THE UNITED STATES, FAMILY COATS OF ARMS OF; PRESIDENTS OF THE UNITED STATES, GRAVES OF THE; UNITED STATES — PRESIDENT'S OFFICE; and the biography of each President in this Encyclopedia.

No. 1. BIRTH AND EDUCATION.

PRESIDENT	Place of birth	Year	College
Washington	Virginia	1732	None.
Adams, J.	Quincy, Mass	1735	Harvard.
Jefferson	Shadwell, Va	1743	Wm. and Mary.
Madison	Port Conway, Va	1751	Princeton.
Monroe	Virginia	1758	Wm. and Mary.
Adams, J. Q.	Quincy, Mass	1767	Harvard.
Jackson	North Carolina[1]	1767	None.
Van Buren	Kinderhook, N. Y.	1782	None.
Harrison	Berkeley, Va	1773	Hampden.
Tyler	Greenway, Va	1790	Wm. and Mary.
Polk	North Carolina	1795	U. of N. C.
Taylor	Virginia	1784	None.
Fillmore	Summerhill, N. Y.	1800	None.
Pierce	Hillsboro, N. H	1804	Bowdoin.
Buchanan	Cove Gap, Pa	1791	Dickinson.
Lincoln	Kentucky	1809	None.
Johnson	Raleigh, N. C.	1808	None.
Grant	Pt. Pleasant, Ohio	1822	West Point.
Hayes	Delaware, Ohio	1822	Kenyon.
Garfield	Orange, Ohio	1831	Williams.
Arthur	Fairfield, Vt	1830	Union.
Cleveland	North Bend, Ohio	1837	None.
Harrison	Caldwell, N. J	1833	Miami Univ.
McKinley	Niles, Ohio	1843	None.
Roosevelt	New York, N. Y.	1858	Harvard.
Taft	Cincinnati, Ohio	1857	Yale.
Wilson	Staunton, Va	1856	Princeton.

[1] It has generally been stated that President Jackson was a native of South Carolina, but the most authentic evidence that could be collected by Parton, the historian, and Kendall, his biographer, shows that he was born in Union County, N. C., about a quarter of a mile from the South Carolina line.

No. 2. VOCATION AND SERVICE.

PRESIDENT	Vocation	Inaugurated	Service — Years
Washington	Planter	1789	7 y 10m. 4 d.
Adams, J.	Lawyer	1797	4
Jefferson	Lawyer	1801	8
Madison	Lawyer	1809	8
Monroe	Statesman	1817	8
Adams, J. Q.	Lawyer	1825	4
Jackson	Lawyer	1829	8
Van Buren	Lawyer	1837	4
Harrison	Farmer	1841	1 m.
Tyler	Lawyer	1841	3 y. 11 m.
Polk	Lawyer	1845	4
Taylor	Soldier	1849	1 y. 4 m. 5 d.
Fillmore	Lawyer	1850	2 y. 7. m 26 d.
Pierce	Lawyer	1853	4
Buchanan	Lawyer	1857	4
Lincoln	Lawyer	1861	4 y. 1. m. 11 d.
Johnson	Statesman	1865	3 y. 10 m. 20 d.
Grant	Soldier	1869	8
Hayes	Lawyer	1877	4
Garfield	Lawyer	1881	6½ m.
Arthur	Lawyer	1881	3 y. 5½ m.
Cleveland	Lawyer	1885	8
Harrison	Lawyer	1889	4
McKinley	Lawyer	1897	4 y. 5 m. 7 d.
Roosevelt	Statesman	1901	7 y. 5 m. 18 d.
Taft	Statesman	1909	4
Wilson	Educator	1913	8

No. 3. DEATH AND BURIAL.

PRESIDENT	Year	Cause	Place of burial
Washington	1799	Pneumonia	Mt. Vernon, Va.
Adams, J.	1826	Debility	Quincy, Mass.
Jefferson	1826	Diarrhœa	Monticello, Va.
Madison	1836	Debility	Montpelier, Va.
Monroe	1831	Debility	Richmond, Va.
Adams, J. Q.	1848	Paralysis	Quincy, Mass.
Jackson	1845	Consumption	Nashville, Tenn.
Van Buren	1862	Asthma	Kinderhook, N.Y.
Harrison	1841	Pleurisy	North Bend, O.
Tyler	1862	Billious fever	Richmond, Va.
Polk	1849	Diarrhœa	Nashville, Tenn.
Taylor	1850	Billious fever	Springfield, Ky.
Fillmore	1874	Debility	Buffalo, N. Y.
Pierce	1869	Stomach inflam.	Concord, N. H.
Buchanan	1868	Rheumatic gout	Lancaster, Pa.
Lincoln	1865	Assassination	Springfield, Ill.
Johnson	1870	Paralysis	Greenville, Tenn.
Grant	1885	Cancer	New York, N. Y.
Hayes	1893	Paralysis of heart	Fremont, O.
Garfield	1881	Assassination	Cleveland, O.
Arthur	1886	Bright's disease	Albany, N. Y.
Harrison	1901	Pneumonia	Indianapolis, Ind.
McKinley	1901	Assassination	Canton, O.
Cleveland	1908	Debility	Princeton, N. J.
Roosevelt	1919	Inflam. rheumatism.	Oyster Bay, N. Y.

No. 4. VICE-PRESIDENTS.

NAME	Place of birth	Term of service
Adams, John	Braintree, Mass	1789–97
Jefferson, Thomas	Shadwell, Va	1797–01
Burr, Aaron	Newark, N. J	1801–05
Clinton, George[1]	Little Britain, N. Y	1805–12
Gerry, Elbridge[2]	Marblehead, Mass	1813–14
Tompkins, Daniel D.	Westchester Co., N. Y.	1817–25
Calhoun, John C.[3]	Abbeville District, S. C.	1825–32
Van Buren, Martin	Kinderhook, N. Y	1833–37
Johnson, Richard M.	Louisville, Ky	1837–41
Tyler, John	Greenway, Va	1841
Dallas, George M.	Philadelphia, Pa	1845–49
Fillmore, Millard	Summer Hill, N. Y	1849–50
King, William R.[4]	Sampson County, N. C.	1853

[1] Died 20 April 1812.
[2] Died 23 Nov. 1814.
[3] Resigned 28 Dec. 1832.
[4] Died 18 April 1853.

No. 4. VICE-PRESIDENTS — *Continued.*

NAME	Place of birth	Term of service
Breckenridge, John C.	Lexington, Ky	1857–61
Hamlin, Hannibal	Paris Hill, Me	1861–65
Johnson, Andrew	Raleigh, N. C	1865
Colfax, Schuyler	New York City	1869–73
Wilson, Henry[5]	Farmington, N. H	1873–75
Wheeler, William A.	Malone, N. Y	1877–81
Arthur, Chester A.	Fairfield, Vt	1881
Hendricks, Thomas A.[6]	Zanesville, Ohio	1885
Morton, Levi P.	Shoreham, Vt	1889–93
Stevenson, Adlai E.	Christian County, Ky.	1893–97
Hobart, Garret A.[7]	Long Branch, N. J	1897–99
Roosevelt, Theodore	New York City	1901
Fairbanks, Charles W.	Unionville Centre, Ohio	1905–09
Sherman, James S.[8]	New Hartford, N. Y.	1909–12
Marshall, Thomas R.	North Manchester, Ind.	1913–

[5] Died 22 Nov. 1875.
[6] Died 25 Nov. 1885.
[7] Died 21 Nov. 1899.
[8] Died 30 Oct. 1912.

UNITED STATES, Sculptors of. See SCULPTURE OF THE NINETEENTH CENTURY.

UNITED STATES, The Wars of the. As generally regarded, the United States is rated as one of the most peaceable nations in the world, the idea being that during the 145 years of its existence it has participated in but six great wars, in all of which, parenthetically, it has been victorious. Notwithstanding the general credence given to this statement, it is far from being in accord with history, for, as a matter of fact, scarcely a year has passed in which either the army or the navy has not been called upon to do battle for the country. After 1900, it is true, the unpleasantness in the Philippines and outlawry on the Mexican border were the only discordant elements, but, prior to that, there were the labor disturbances; the Indian wars and massacres and a dozen other factors that kept the United States forces almost constantly engaged in warfare of a more or less consequential character. At times, of course, some of the disturbances were little more than riots, but there were other events which seem to have been quite as thoroughly forgotten by the ordinary reader of history, but which in every respect deserve a place in the catalogue of wars. In fact the War of the Revolution had scarcely commenced when the colonists were compelled to meet the attacks of the Indians who, inspired by the English, instituted an incessant border warfare against the whites; a warfare of brutality which culminated in the bloody massacres in Wyoming Valley, Pa., and Clinton, N. Y.

The Shays' Rebellion.—The first armed and organized rebellion against the conduct of political affairs in the United States, however, occurred in Massachusetts in 1786, when Daniel Shays organized the dissatisfied faction in the community into an armed and determined force of malcontents. The cause of this early trouble was largely a financial one. Solid money was still scarce, with paper money practically worthless, and yet affairs were at such a state that debts contracted upon a paper basis were pressed for payment in solid money. As this was a period when men were imprisoned for debt, such conditions were held to be almost usurious in their effect and the orderly meetings of protest which were at first held soon developed into violent assemblages. In August

the tide of dissatisfaction had become so strong that uprisings occurred in many parts of the State; courthouses were seized and courts were prevented from sitting; the governor announced his determination to put down the rebellion and there were several engagements between the insurgents and the volunteer forces of the State. At last, in February 1787, General Lincoln surprised the rebels at Petersham, where, after a decisive engagement, they were dispersed.

The Whisky Rebellion.— The announcement that the Federal government had assumed the right to levy an excise tax was the cause of the insurrection in Pennsylvania which is now commonly referred to as the "Whisky Rebellion." The act, which was passed in May 1792, was strenuously opposed on political grounds, the argument against it being that it was dangerous to the doctrine of individual liberty. In the four western counties of Pennsylvania whisky was a staple product, and, aside from its political aspect, the people felt that such a tax was an unjust discrimination against that region. The attempts to enforce the law were resisted with violence, therefore, and all citizens who advocated conformity to the law, or who quietly conformed to it were subjected to various kinds of ill-treatment by their neighbors. To further inflame the spirit of opposition incendiary posters, all signed "Tom the Tinker," were displayed in all directions and there was rioting and bloodshed in many places. In this emergency, President Adams assumed control of the situation and sent 13,000 troops upon Parkinson's Ferry in time to receive the peace overtures of the rebels. They were not accepted, however, and many arrests were made.

War with France.— One of the first troubles with which President Adams had to contend was the French question, for it had then become plain to all that America would have to take some decided steps if she was to maintain her honor against the arrogance of France. The President's policy of neutrality, following on Jay's treaty with England, had greatly exasperated France and when the American envoys were ordered out of that country it became apparent that war could not be far off. In fact French and American vessels did meet on the ocean, but in the encounters that followed, thanks to Captain Truxton and his frigate *Constellation*, the United States did not make a discreditable appearance. In the battle with the French frigate *L'Insurgente*, off the island of Nevis in the fall of 1799, as well as in her encounter with the frigate *La Vengeance*, off Guadaloupe, in February 1800, the *Constellation* was victorious. Realizing that war was already under way upon the water, the United States government began to prepare her land forces. General Washington was again summoned from his retirement at Mount Vernon to assume command of the army, but as the formal declaration of war was deferred, Napoleon's seizure of the governmental power in France gave a new aspect to the situation and a treaty of amity was soon concluded between the two countries. See UNITED STATES — THE WAR WITH FRANCE.

The Fries' Rebellion.— What is known in the history of Pennsylvania as "Fries' Rebellion," or the "Window Tax War," was the result of an act of Congress, which, in July 1798, levied a direct tax of $2,000,000, of which the sum of $237,000 was apportioned as Pennsylvania's quota. In this State the tax was appraised upon houses and land, the amount assessed against each house being determined by the size and number of its windows. In some portions of the State the tax was accepted practically without protest, but the German residents of Montgomery, Lehigh, Bucks and Berks counties organized opposition to it under the leadership of John Fries. It was not long before there was open conflict between the rebels and the United States authorities, one of the acts of the insurgents being an attack upon the marshal at Bethlehem, where that official was compelled by force of arms to liberate 30 persons whom he had arrested for their opposition to the window tax. Under the circumstances an appeal was made to President Adams and the militia was ordered to suppress the rebellion, which ended with the capture of Fries and a number of his adherents. Taken to Philadelphia, Fries was twice tried for treason, and, being convicted, was sentenced to death. In 1800 he was pardoned by the President.

The Barbary War.— It was not long after the signing of the treaty of peace with England that the Barbary powers commenced to annoy American commerce. In 1784 the *Betsey* was captured; in 1785 the *Maria* of Boston and the *Dauphin* of Philadelphia were seized and their crews held as captives with threats of ultimate slavery if the ransom, amounting to some $60,000, was not paid. As ransom was regarded as cheaper than force, various large sums were contributed at the command of the Dey of Algiers. To Thomas Jefferson, however, such abject submission to a barbarous ruler was particularly loathsome and he decided to put an end to such outrages. Commodore Dale was, therefore, ordered to the Mediterranean, where one of his vessels, the *Experiment*, soon captured a Tripolitan cruiser of 14 guns and, by 1803, war was on in earnest, culminating, on 27 April, in the bombardment of Tripoli.

Slave Insurrection, Louisiana.— In January 1811 there was an uprising of slaves which extended throughout the entire parish of Saint John, La. The whites armed themselves and there were several serious battles between the two forces, more than 60 of the negroes having been killed before the slaves could be forced to surrender.

War of 1812.— The bloodless Burr conspiracy; the Sabine expedition; the unwarranted attack upon the *Chesapeake* by the *Leopard*, a British two-decker; and the troubles resulting from the Lake Champlain embargo, all of which kept the United States forces engaged in more or less active service, were soon forgotten in the more important declaration of war with Great Britain (see UNITED STATES — THE WAR OF 1812), and this conflict had scarcely commenced before the troubles with the Indians began once more with the Seminole War in Florida. The growth of the country; the expansion of its territory; the explorations of venturesome spirits who were continually opening up new lands for settlement, all had a tendency to arouse sentiments of dissatisfaction in the minds of the red men. They saw that encroachments were constantly being made upon them; the fields of the white man interfered with their hunting and fishing; the industry and other features of civilization were distaste-

ful to them and, as original occupants of the land, one by one the various tribes began to enter their vigorous protests, protests which finally assumed warlike proportions. From the beginning of the War of 1812, therefore, almost up to the beginning of the 20th century, the soldiers of the United States have been engaged in battles with the Indians and as these almost continuous disturbances and massacres have occurred first in one part of the country and then in another the present-day submission of the red man has not been obtained without the expenditure of much money and the cost of many lives. At about the same time, throughout the Southern States, a spirit of dissatisfaction was also being engendered; the dishonesty of the blacks and the danger of slave insurrections making rights in property insecure. Of these insurrections there were several, but the only one that attained any great degree of importance was the Turner Rebellion which broke out in Virginia in 1831.

Nat Turner's Rebellion.—Among the blacks in Virginia there was one who exerted a great influence over the slaves. His name was Nat Turner, and he firmly believed that he had been called of God to lead his people to freedom. He had heard voices calling to him from the air; he had seen strange signs in the sky and all the portents which he could interpret gave additional proof of his divine commission. Forming an alliance with three other blacks and three ignorant white men, he began his crusade by killing several families. Wherever he went there was bloodshed, while everywhere he pressed the slaves into his service until he was accompanied by a force of more than 200 persons. Unable to suppress the insurrection, an appeal to the government was made and both Virginia and North Carolina sent troops to the scene of the outrages. As the result, all the insurgents were either killed or captured; Turner and 16 of the leading spirits were hanged and scores were punished, some most inhumanely and without trial, their bodies being decapitated and their heads impaled along the highways as a warning.

Troubles Under Jackson's Administration.— The political contest which shook the Union to its very centre in 1832, culminated, in all its violence, in the South Carolina doctrine of State Rights and Nullification. The origin of the trouble was the tariff: first, the tariff passed during the Adams administration, which was extremely distasteful to the South, and, second, the tariff of 1832, which was even more so, and as, at this time, there was a powerful party in South Carolina which contended that Congress had no power to impose taxes for the protection of home industries or manufactures, and who held that each State had the right to judge if Congress had exceeded its powers, and, if so, to disobey it, it was not long before the new act was declared unconstitutional. It was resolved, therefore, to prevent its enforcement in the port of Charleston, even by armed resistance, or by withdrawal from the Union. In fact, so strong was the feeling upon this subject that the nation was threatened with dissolution. President Jackson, however, refused to listen to the arguments of the nullifiers, the leaders among whom were Hayne and Calhoun, the latter having resigned the Vice-Presidency to accept a seat in the Senate in order that he might speak upon this question, and he at once ordered troops to Charleston. The presence of the soldiers had a quieting effect upon the belligerents, who postponed their threatened action, and the difficulty was finally settled by the Clay compromise bill. More trouble with the Indians and the "Toledo War," a dispute over the southern boundary between Ohio and Michigan, which followed the admission of the latter State to the Union, were among the factors that disturbed the Jackson administration, but none of these events were as important as the Mormon disturbances and the "Patriot War," which occurred soon after Van Buren's succession to the Presidency.

Mormon Disturbances.— During the peregrinations of the Mormons, prior to their ultimate settlement in Utah, they attempted to locate in several places, but as their presence was not relished by other citizens, who charged them with such crimes as robbery, arson and secret assassinations, they had frequent conflicts with mobs and were driven from spot to spot until they made their final stand in Missouri, at the town of Far West, in Caldwell County. Here they were joined in 1838 by Joseph Smith and Sidney Rigdon, who, after the failure of the Mormon Bank at Kirkland, Ohio, had fled from that State to avoid arrest for fraud. To the troubles arising from the hatred and distrust of the people of Missouri there were soon added those of internal dissensions. On 24 Oct. 1838 Thomas B. March, president of the 12 apostles, and Orson Hyde, one of the apostles, made affidavit that Smith and Rigdon placed the teachings of the Book of Mormon and the regulations of the Church above the laws of the land and that there also existed among the Mormons a band known as the "Danites," organized to execute the will of the head of the Church, whether it were legally right or wrong. Under such conditions the feeling against the Mormons grew so strong that it was determined to drive them from the State. Smith and Rigdon had already been arrested on charges of treason, murder and forgery, but their adherents fortified their settlement and resisted both the popular will and the law so strenuously that it became necessary to call out the militia to expel them. They at once turned their steps toward Illinois, where they founded the city of Nauvoo, but the authorities were to have still more trouble with them, the most serious disturbances being those of 1844, when they were driven out of Illinois, and those which followed the Mountain Meadow Massacre, in 1857, when an army of 2,500 men, under Col. Albert Sidney Johnston, was sent to Utah to put down Mormon resistance to United States' authority.

Alton Riots, Illinois.— The Alton, Ill., riots resulted from a popular uprising against the Saint Louis *Observer* and its owner, Rev. Elijah P. Lovejoy. Compelled to leave Saint Louis by reason of his anti-slavery proclivities, Mr. Lovejoy took his paper to Alton, Ill. There, too, he provoked enmity, however, and several riots occurred, his newspaper plant being destroyed no less than three times. On the occasion of the last riot, 7 Nov. 1837, Mr. Lovejoy was killed.

Patriot War.— Friendly relations with Great Britain were again endangered in 1837,

when the so-called "Patriot War" broke out on the Canadian frontier. Sympathizing with the movement, the people of the United States did much to aid the insurgents, some New Yorkers even going so far as to seize an island in the Niagara River. These acts, however, received such prompt repudiation from the government, which not only issued a neutrality proclamation, but sent General Wool to the Niagara frontier to preserve the peace, that no ill effects resulted. Equally successful was General Scott, who was sent to the northeast frontier to quiet the disturbances which had resulted from a dispute over the boundary line between Maine and New Brunswick.

Dorr Rebellion.—Although friendly relations were maintained with all foreign powers during Tyler's administration, several internal disturbances occurred which called for quick action upon the part of the authorities. In Rhode Island, for example, the Dorr Rebellion required the presence of the United States troops, while the militia was called upon in New York to suppress the anti-rent rioters. According to the judgment of later days Thomas W. Dorr, the political reformer who led Rhode Island into its only insurrection, was a man whose chief offense was that he was in advance of his time, for since his death every reform for which he argued and for which he was ready to fight has been freely adopted by the people of the State. According to the charter which had been granted to Rhode Island by Charles II, in 1663, no person was permitted to vote for town or State officials unless he was possessed of a certain amount of real estate. Under a subsequent statute of the legislature no person could be admitted a free man of any town, with such political privileges, unless he owned a freehold estate to the value of $134 or was the eldest son of such a freeman, qualifications which barred fully two-thirds of all the citizens of the State from becoming legal voters. It was to these provisions that Dorr and his adherents objected and when they found that they could not accomplish their purpose in any peaceable way, recourse was had to arms. The insurgent forces, however, were defeated and dispersed upon each occasion. Dorr, who was convicted of high treason, was subsequently pardoned.

Anti-Rent Rebellion.— During this time the New York authorities were engaged in trying to suppress the anti-rent rebellion. According to the statement of Willard, the historian: Under the early Dutch governors of New York certain settlers received patents of considerable tracts of land, that of Van Rensselaer being the most extensive, comprising, as it did, the greater portions of Rensselaer and Albany counties. These lands were divided into farms of from 100 to 160 acres and leased in perpetuity on condition that the tenant pay annually, to the landlord or "patroon," a quantity of wheat from 22½ bushels to 10, in addition to four fat fowls and a day's service with wagon and horse. If the tenant sold his lease, the landlord was entitled to one-quarter of the purchase money. The summer of 1844 witnessed the most violent disturbances by the Anti-Rent party in the eastern towns of Rensselaer, in the Livingston Manor, in Columbia County. The Anti-Renters formed themselves into associations to resist the law and armed and trained bands, disguised as Indians, scoured the country, crying "Down with the rent!" and in various ways intimidating those who favored the execution of the law. In 1846 Silas Wright was chosen governor of the State and, by his wisdom and firmness, public order was restored. By proclamation, he declared the locality in which these disorders prevailed to be in a state of insurrection; resolute men were made sheriffs, military forces were brought into requisition and the leading Anti-Renters were not only brought to trial but were convicted.

The Revolt in New Mexico.— The revolt against the authority of the United States government which broke out at Taos in 1847, was quickly suppressed by the Federal forces under the command of Col. Sterling Price. Montoya, the leader of the insurrection, who had assumed the rôle of governor, was captured, tried by court-martial and shot 7 Feb. 1847.

Kansas Border Warfare.— Following the Mexican War (q.v.) the government was engaged in almost continuous conflicts with the Indians, while the "Know Nothing" disturbances, which followed the organization of the American party and resulted in anti-foreign and anti-Catholic riots in various parts of the country, caused no little trouble. As the years passed, however, the anti-slavery question had pushed itself further and further to the front and it required no inspired prophet to predict that a few such disgraceful incidents as those which accompanied the rendition of Anthony Burns in Boston would make the issue the vital one for the nation. In the meantime the Kansas border troubles, troubles which practically resulted in civil war, held the attention of the people. This sectional excitement arose from the introduction of a bill into Congress by Senator Douglas of Illinois, which provided for the organization of that vast tract lying west of Missouri, Iowa and Minnesota, into two Territories, Kansas and Nebraska, each of which, being exempt from the operations of the Missouri Compromise, should come in as free or slave States according to the vote of the people at the time of their admission. Although this bill was fiercely fought in Congress, it was passed in 1854, upon which there began a terrible struggle for the possession of Kansas. From the Northwest and the East the anti-slavery men flocked into the Territory, while the slavery partisans, with their slaves, rushed in from the South, each party being determined to people the new land with settlers in sympathy with their respective views. To make matters worse the Missourians — or so it was charged — crossed the borders by the hundreds and, wherever it was possible, controlled the elections. As the result of the disruption two sets of Territorial officers were elected and civil war with all its attendant evils followed. During the summer of 1856 the Territory was in constant war. Men were murdered and towns were sacked, and while both sides were guilty of violence, the Free-State party was much the less so, being confessedly in the majority. For two years Kansas suffered, but at last the opponents of slavery gained the upper hand and, in 1861, Kansas was admitted as a free State. Among the many anti-slavery leaders in Kansas none had been more prominent than John

Brown (q.v.), a man of great courage, who believed that the liberation of the slaves could be easily accomplished if they should be given an opportunity to rise. With 21 men, therefore, Brown went to Virginia to carry out his purpose. They succeeded in seizing the United States arsenal at Harper's Ferry, but as neither the negroes nor the anti-slavery whites gave them the support for which they had hoped, they were soon overpowered by a force of marines. With the exception of two, who escaped, all the participants in the revolutionary movement were either killed during the engagement or hanged afterward, the latter being the fate of John Brown.

Fenian Troubles.—Shortly after the close of the Civil War (q.v.) in the United States, leaders in the long continued struggle for the emancipation of Ireland undertook to make the United States the base of operations against England by the invasion of her Canadian possessions. There was an organization of formidable numerical strength, largely composed of a military body known as the "Fenian Brotherhood." During the excitement large sums of money were raised, bodies of soldiers were organized and drilled and war material was gathered together at convenient points. The first actual attempt at invasion was made in April 1866, when an iron steamship was purchased in New York and manned to carry arms and munitions of war to Eastport, Me., from whence a descent was to be made upon the island of Campobello, belonging to New Brunswick, and the breakwater between Eastport Harbor and the Bay of Fundy. Pending the arrival of the steamer some 500 Fenians had gathered at Eastport, but the boat did not sail, the order for her departure having been countermanded by the leaders of the movement in New York. The intending invaders, however, remained at Eastport, to which point a schooner was dispatched with 750 stand of arms sent from Portland, but on representations made by the British consul these were seized by the United States authorities, and while the Canadian troops were sent to the frontier from Saint John and a British warship was stationed outside the island of Campobello, there was also an American force on hand under command of Captain Meade. Later, in May of the same year, the Fenians made a more pretentious demonstration, under the direction of General Sweeney, but before anything was accomplished in the way of getting upon Canadian soil the United States authorities seized 1,000 stand of arms at Rouse's Point, N. Y. Several other seizures afterward occurred and, in the meantime, the entire volunteer force of Canada was ordered out. On 1 June between 1,200 and 1,500 Fenians crossed the Niagara River at Buffalo in canal boats. They were under command of Captain O'Neil, a graduate of West Point. A skirmish took place the following day, when it was reported that nine Canadians had been killed and a number wounded. At this time Gen. U. S. Grant was in command of the United States troops sent to the frontier and he not only prevented any reinforcement of the invaders, but arrested the entire Fenian army upon its return, placing all members of the party under parole to keep the international peace. On 7 June another expedition entered Canada, going from Saint Albans, Vt., and Malone, N. Y. This force numbered nearly 2,000 men. It advanced upon Saint Armand, which the Canadians had evacuated, but on the 9th, the Canadian force returning, the Fenians were driven back, with a loss of 15 prisoners.

Walker's Expeditions.— The violation of the neutrality laws was always the excuse for the United States' interference with William Walker's various filibustering expeditions. In 1853 this famous American adventurer invaded Lower California, where, his plans failing, he surrendered to the United States authorities at San Diego. Having escaped conviction, two years later he invaded Nicaragua, where, for a time, he was successful. In 1857 he fell, however, and on 1 May he surrendered to Commodore Charles H. Davis of the United States sloop-of-war *Mary*. Taken to New Orleans, he not only escaped trial, but, evading the government authorities who were watching him, he organized another expedition and landed at Greytown on 14 Nov. 1857. Shortly after landing, however, he was again compelled to surrender to Commodore Paulding of the United States frigate *Wabash*. Although the United States authorities had no further trouble with Walker, his next expedition was a fatal one, for, having invaded and captured a part of Honduras, he was himself captured by the commander of the British man-of-war *Icarus*, by whom he was delivered to the Honduran officials, and was shot, 12 Oct. 1860.

The Draft Riots.— The necessity of reinforcing the Union army by means of conscription resulted in the development of a strong spirit of opposition to the government, a sentiment which, in New York and Boston, culminated in uprisings that were suppressed with great difficulty. In New York City the outbreak occurred on 13 July 1863; in Boston, a day later, but while the Boston riot was suppressed by the militia within 24 hours and at the cost of only one life, in New York order was not restored until the 16th. During this period of disturbance property to the value of more than $2,000,000 was destroyed and it was estimated that fully 1,000 of the rioters fell in the various battles between the troops and the people.

Tin Horn War.— The Ku-Klux (q.v.) disturbances in the South; the later and still fruitless Fenian demonstration on the Manitoba frontier; the insurrection against Governor Kellogg in Louisiana; the race riots and massacres in several of the Southern States; the troubles arising from the opening of Oklahoma and the Cherokee Strip, and the Chinese labor riots in the West, were events which, like several of the labor uprisings of later days, have required the attention of United States troops or State militias for their suppression. Of more consequence, however, was the "Tin Horn War," the last affair of importance with which the United States had to deal prior to the War with Spain and the later insurrection of the Philippine Islanders. The "Tin Horn War" was in reality a series of outbreaks against the Mexican government, beginning in the autumn of 1891 and continuing intermittently into the early part of 1894. In each of these outbreaks the insurgents operated along the Rio Grande, and evidently relied upon the contingency of the United States for safety in case of defeat.

Catarino Garza, who had conducted a number of periodicals opposed to the administration of President Diaz, inaugurated the first of this series of troubles in September 1891. He was at that time living on his cattle ranch in Texas, near Palito Blanco, at which place he collected his band of revolutionists. Issuing a manifesto, in which he proclaimed the overthow of Diaz, he crossed the Rio Grande with less than 100 men, who were reinforced from time to time by sympathizers in the movement. There were many brushes with the Mexican troops and, little by little, the insurrectionary spirit extended. The fact that the insurgents took refuge on American soil when worsted made it necessary for the United States authorities to act, and two companies of infantry, with two of cavalry, did effective work in preventing the violation of American neutrality. The Mexican government sent a strong force to the scene of trouble and the fighting degenerated into guerrilla warfare. During the latter part of 1892 there was another gathering of insurgents, under leaders named Pacheco and Perez, the scene of operation being several hundred miles above that of Garza's war. The rebels captured Ascension and Corralitos, driving out the American settlers who crossed the Rio Grande into New Mexico. The Indians along the Yaqui River joined in this uprising, while another band of rebels, under the leadership of a man named Amalla, added to the complications. During this period General McCook had maintained a force on the American side of the Rio Grande and it was largely through his efforts that, in 1893, the insurgents were dispersed. The last outbreak occurred in January 1894, when two filibusters named Ochoa and Lugan attempted to revive the insurrection. They were unsuccessful, however, being dispersed after two somewhat sharp engagements.

The Colorado War.— Disturbances resembling in intensity and bitterness the Pullman Car Company strike and the mining troubles at Cœur d'Alène, Idaho, occurred during the winter and spring of 1903–04 in the Cripple Creek mining district, Colorado. In the summer of 1903 a strike was ordered and several thousand miners went out. Three weeks after the inauguration of the strike, an assault on two miners resulted in the ordering of State militia to the region. The presence of the soldiers was resented and rioting followed. Martial law was declared, "bull pens" established and the leaders of the strikers arrested on various charges. Later on, prominent strikers were deported by order of the military. A state of almost civil war existed, which increased as the spring advanced.

Boxer War.— In 1900 for the first time since the Revolutionary War soldiers of the United States fought in company with troops of the European nations in Peking during the Boxer Rebellion (q.v.).

Pacification of Cuba.— In 1906–09 United States troops were in occupation of Havana and other parts of Cuba, remaining until order was restored between the two rival parties in Cuba.

Vera Cruz Affair.— In 1914 friction developed with Mexico over the capture of United States sailors in a Mexican harbor. The American admiral demanded reparation and a salute to the American flag. This not being forthcoming Vera Cruz was taken by American troops in April.

Mexican Border Embroglio.— From 1911 to 1916 and even later conditions bordering on anarchy prevailed along the Mexican front; several raids were made on American border towns and in March 1916 Major John Pershing was sent into Mexico as commander of a punitive expedition to pursue the bandit, Francisco Villa. After many weary weeks the troops were withdrawn, their object unattained.

War with Germany and Austria.—As a result of Germany's submarine policy in the World War the United States was drawn into the great conflict in April 1917. Men and munitions in ever-increasing numbers and quantity were dispatched to the fighting fronts, resulting in the collapse of the Central Powers in the closing months of 1918.

The following is a practically complete list of the wars and minor engagements or disturbances in which the United States has participated since 1775:

1775–1783	War of the Revolution, 19 April 1775 to 11 April 1783.
1782–1787	Wyoming Valley Massacres, Pennsylvania.
1786–1787	Shays' Rebellion, Massachusetts.
1790–1795	War with Northwest Indians.
1792–1794	Whisky Insurrection, Pennsylvania.
1798–1800	War with France.
1799	Fries' Insurrection, Pennsylvania.
1801–1803	War with Tripoli.
1806	Burr Conspiracy.
	Sabine Expedition, Louisiana.
1807	Chesapeake Bay Naval battle.
1808–1809	Lake Champlain embargo.
1811–1813	War with Northwest Indians.
1811	Slave Insurrection, Louisiana.
1812–1815	War with Great Britain.
1812	Seminole War, Florida.
1813	Peoria Indian War, Illinois.
1813–1814	Creek Indian War, Alabama.
1817–1818	Seminole War, Florida.
1819	Yellowstone expedition.
1823	Upper Missouri River campaign against Blackfeet and other Indian tribes.
1827	Le Fevre Indian War, Wisconsin.
1831	Turner's Rebellion, Virginia.
	Sac and Fox troubles, Illinois.
1832	Black Hawk War.
1832–1833	Nullification disturbances, South Carolina.
1833–1839	Cherokee disturbances.
1834	Pawnee Expedition, Indian Territory.
1835–1836	Toledo War, between Michigan and Ohio.
1835–1842	Seminole War, Florida.
1836–1837	Sabine disturbances, Southwestern frontier.
	Creek disturbances, Alabama.
1837	Osage Indian troubles, Missouri.
	Riots. Alton, Ill.
1838	Heatherly Indian disturbances, Missouri and Iowa.
	Mormon disturbances, Missouri.
	Maine boundary trouble.
1838–1839	Patriot War, Canadian frontier disturbances.
1840–1842	Dorr War, Rhode Island.
1841–1846	Anti-Rent Riots, New York.
1846–1847	Doniphan's expedition from New Mexico to Mexico.
1846–1848	Mexican War.
	New Mexico Revolt.
1848	Cayuse War, Oregon.
1849–1861	Navajo troubles, New Mexico.
1849	Astor Place Riot, New York.
	Continuous disturbances with Indians, Texas.
1850	Pitt River expedition, California.
1850–1860	Know-Nothing disturbances.
1851–1852	Yuma expedition, California.
1851–1853	Utah Indian troubles.
1851–1856	Indian wars in Oregon and Washington.
1855	Rendition of Anthony Burns, Massachusetts.
	Yakima Indian expedition, Washington Territory.
	Winnas Expedition against Snake Indians, Oregon.
1856	Attack on Canton forts, China.
1855–1856	Cheyenne and Arapaho troubles.
	Seminole War, Florida.
1855–1860	Walker's expedition.
1856–1858	Kansas border troubles.
1857	Gila expedition, New Mexico.

1857	Sioux Indian troubles, Minnesota and Iowa.
	Mountain Meadow Massacre, Utah.
1857–1858	Utah expedition.
1858	Puget Sound expedition, Washington Territory.
	Expedition against Northern Indians, Washington Territory.
	Navajo expedition, New Mexico.
	Spokane and other Indian troubles, Washington Territory.
1858–1859	Wichita Indian troubles, Indian Territory.
1859	Colorado River expedition, California.
	Pecos expedition, Texas.
	Antelope Hill expedition, Texas.
	Bear River expedition, Utah.
	San Juan trouble, Washington Territory.
	John Brown raid, Virginia.
1859–1860	Cortina troubles, Texas and Mexican border.
1860	Piute expedition, California.
	Kiowa and Comanche expedition, Indian Territory.
	Carson Valley expedition, Utah.
	Bannock Indian Massacre, Snake River, Idaho.
1860–1861	Navajo Indian expedition.
1861–1890	Apache Indian wars and troubles, New Mexico and Arizona.
1861–1866	Civil War.
1862	New Ulm Indian massacres, Minnesota.
1862–1867	Sioux Indian wars, Minnesota and Dakota.
1863–1869	War against Indians in Kansas, Nebraska, Colorado and Indian Territory.
1863	The Draft Riots.
1865–1868	Indian wars in Oregon, Idaho, California and Nevada.
1865–1866	Fenian raid, Canadian border.
1866–1870	Ku-Klux disturbances, Southern States.
1867–1881	Campaign against Lipan, Kiowa, Kickapoo and Comanche Indians.
1868–1869	Canadian River expedition, New Mexico.
1871	Yellowstone expedition.
	Fenian disturbances on the Manitoba frontier.
1872	Yellowstone expedition, Dakota.
1872–1873	Modoc campaign.
1873	Yellowstone expedition, Dakota.
1874–1875	Campaign in Indian Territory.
	Insurrection against Governor R. D. Kellogg, Louisiana.
1874	Sioux Indian expedition, Wyoming and Nebraska.
	Black Hills expedition, Dakota.
	Big Horn expedition, Wyoming.
	Race riots at Austin, Miss., and Trenton, Tenn.
1875	Eastern Nevada expedition.
1876	Sioux expedition, Dakota (Custer Massacre).
	Powder River expedition, Wyoming.
	Massacre of negro militiamen by whites, Hamburg, S. C.
1876–1877	Big Horn and Yellowstone expeditions, Montana and Wyoming.
1876–1879	War against Northern Cheyenne and Sioux Indians.
1877	Nez Perce campaign.
1878	Bannock and Piute campaigns.
	Ute expedition, Colorado.
1879	Sheep-eater Indian troubles, Idaho.
1879–1894	"Oklahoma Boomers" and Cherokee Strip disturbances.
1879–1880	Ute Indian campaign, Colorado and Utah.
1885	Chinese miner disturbances, Wyoming.
1890–1891	Sioux Indian disturbances, South Dakota.
1891–1893	The "Tin Horn War," Texas and Mexican border.
1892–1896	Trouble with renegade Apaches, Arizona and Mexican border.
1894	Coxey's Commonweal and other industrial army disturbances.
1898–1899	War with Spain.
1898	Chippewa Indian disturbances, Leech Lake, Minn.
1899–1902	Insurrection in Philippine Islands.
1900	Boxer Rebellion.
1903–1904	The Colorado mine disturbances.
1906–1909	Pacification of Cuba.
1914	Capture of Vera Cruz.
1912–1919	Mexican Border Patrol.
1917–1919	War with Germany and Austria-Hungary.

UNITED STATES ARCHITECTURE.

The earliest settlers within the present limits of the United States have left us little in the way of architectural remains. Leaving an old and civilized country and starting life anew in the untrodden vastness of a wild world of primeval peoples, they devoted their time and strength to clearing the land and cultivating the soil, living meanwhile in hastily constructed log cabins or rude houses of clay, stone and wood. The tide of immigration grew larger yearly, and soon homes were built replacing the pioneer emergency domiciles, and though not palatial in any sense of the word made comfortable and satisfactory dwelling places. The effect of the constructive methods of the different mother countries is evident in these buildings. With the increase of wealth came the desire for better and more pretentious architecture. In the southwest during the 16th, 17th and 18th centuries, influenced by Spanish types, were built picturesque mission buildings (New Mexico: San Juan de les Caballeros, 1598; California: Santa Barbara, 1787), cathedrals (Saint Francis, Santa Fé, 1713; Florida, cathedral, Saint Augustine, 1793; Louisiana, cathedral, New Orleans, 1792), and a few secular constructions (Florida, Fort San Marco, Saint Augustine, 1756; Louisiana, Cabildo, New Orleans, 1795). As the Spanish Dominion in North America took the form of conquest rather than colonization, the conditions making for growth and prosperity were lacking in these provinces and is reflected in the stunted architectural development. The long slender column of our Colonial style is not the result of an æsthetic development. The classic proportion of the column of the Georgian period was abandoned by the construction during the Colonial period through necessity as imposed by law and not through choice. The column with a height of 15 and even more diameters is not the outcome of years of development and study to improve the already well-established and accepted proportions of the Classic columns — the sudden abandonment of the columnar proportion that had satisfied both the structural and æsthetic requirements of classic design for centuries was due uniquely to an order of the British Privy Council, prohibiting the colonists from cutting down for domestic construction trees of a diameter greater than 16 or 18 inches, in order to reserve for the construction of the British ships and especially for the spar and masts, the trees of the larger diameters. The immediate result of this order was to force the colonists in the construction of a porch two stories in height to use a column in which the ratio of diameter to height was far greater than in the established classic proportion. The radical change in the colonial column necessarily affected the established proportions of the other architectural elements to a degree in excess of the structural limitations of the materials used. And the resulting bastard style cannot be regarded as the naïve efforts of an artist in using forms with which he is not thoroughly familiar, as seen in the early period of development of the Renaissance in Europe. The lack of a developed architectural appreciation in the colonial builder is well exemplified in his use of wooden groins. This reversal of the usual development of a structural element from wood into stone is probably unique.

In the vicinity of the Hudson Valley and on Long Island the Dutch settlers constructed long, low houses of rough stone garnished with brick, with timber gabled roofs, the eaves of which projected far over the side walls. Though simple in design, these Dutch houses, like those of the immigrants of other nations who settled in the United States, show that

Old World restrictions imbued the builders with a spirit of deference to inherited customs; with the result that they followed the traditions of their teachers, and built as they had been taught, instead of developing new ideas and methods to meet the new condition. This did not prevent them, however, from adapting to their needs available materials, and a variety of them were frequently employed in the same building; stone, brick, stucco, clapboards and shingles being used together in such a manner as to result in a harmonious whole. In the houses of the more wealthy, dressed or cut stone was frequently employed, and in those of the less well-to-do or less exacting, rubble masonry sufficed. The ground floor was used for kitchen, living-room and bedchambers, and the upper floor for the storage of supplies and at times for slave quarters. In the early days dormers were seldom employed, when light was necessary windows were introduced in the gable ends. Later, the introduction of the gambrel roof with its steep slope and the elimination of waste space just inside the eaves made it possible to use the second or attic floor for bedchambers, as well as for storage.

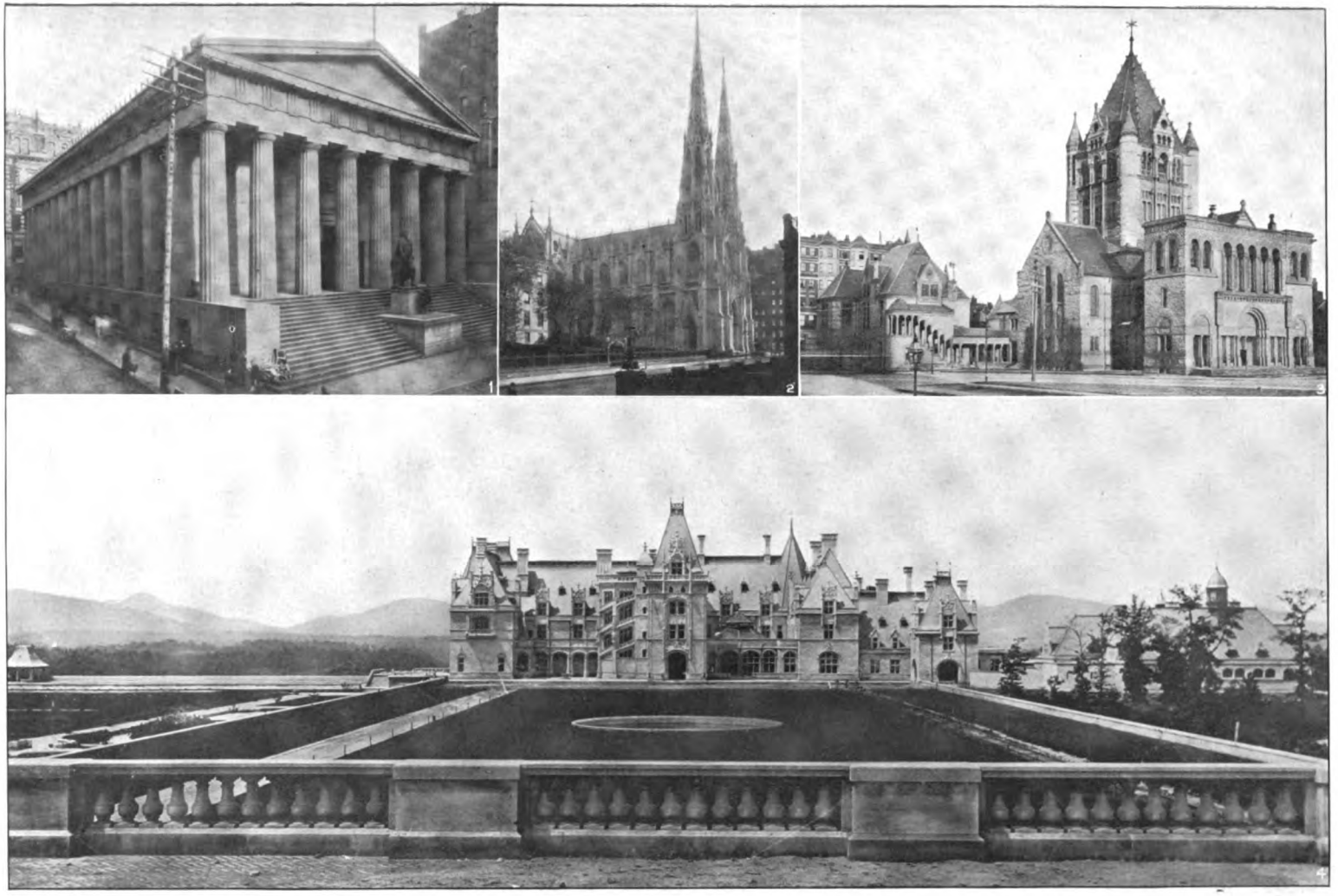
Before the 18th century, the Dutch doorway was merely a rectangular entrance into the house, an occasional narrow transom with small square lights being the only attempt at adornment. The doors were either solid or divided at mid-height. Sometimes a simple stoop was built at the entrance with settees arranged on either side. In the latter part of the century, however, more attention was paid to the entrance, and during the last quarter, Georgian motifs were informally introduced with a broad individuality of treatment, which oftentimes indicated but the first inspiration. In the interior it became possible to expand the construction indefinitely on account of the lack of formality of plan. Often there were two large square rooms on the first floor front, one on either side of the hall which extended from the front to the back door; and an oblong bedroom on either side at the rear. As the family expanded, succeeding generations witnessed the building of a large addition or a number of smaller ones. Each of the large rooms had an enormous chimney, unornamented or crowned with a plain overmantel which extended well into the room. With the advent of the Georgian influence, a tendency arose toward more elaborate decoration in the doorways and in order to relieve the former plainness carved wood moldings, leaded glass fans and side lights were used.

In domestic buildings in the Dutch, German and French Huguenot settlements of Central New York, New Jersey and Pennsylvania it is exemplified in the Lefferts House, Erasmus Hall and other frame buildings of Long Island, The Memorial House, New Paltz, the Sennet House, Kingston, The Hasbrook House, Newburgh, Clinton Mansion, Poughkeepsie, and other stone buildings in the Hudson and Mohawk valleys and throughout New Jersey and Pennsylvania, The Schuyler Mansion, Albany, The Herkimer Home, Little Falls, and other brick buildings of the Hudson and Mohawk valleys. Crude and unrefined, frankly the products of the craftsman's art, these dwellings so closely resemble their English neighbors in general attributes that they cannot be said to have been developed in a distinctive style such as would warrant a departure from the broad classification of Colonial.

In New England, race craft determined architectural design. Original touches whereever introduced were not from mere caprice but from obvious local needs which the formal styles of England had not provided for, until at length there was established a type of architecture the result of successive evolutionary types, that was a distinctively characteristic product of New England. At first small, the houses were of one or two stories, with sharp peaked roofs, stone chimneys, and small windows; a long, narrow lean-to being frequently added in the rear to serve as the kitchen. In the earlier houses, of which the Paul Revere house in Boston is an excellent example, the original construction was of the half-timber variety, with clay, or brick and stone pugging as used in England, the clapboard casing being added later when the severity of the winters made it apparent that a more substantial form of exterior sheathing was necessary. In the interior plan, the New England house had two rooms to a floor, or three when the kitchen lean-to was added, in the latter case the room originally used as a kitchen became a sitting-room with that adjacent as a sleepingroom. A few of the larger and more elaborate houses, Governor Eaton's at New Haven among them, were architecturally more pretentious, with an E-shape design of four rooms on the first floor and several more, usually sleeping and storerooms, on the second.

In Pennsylvania, West Jersey and Delaware the mixed nationality and clannishness of the early settlers caused the architecture of the surrounding country to fall into several separate and distinct channels. Each race preserved the traditions familiar to the mother country, the Welsh expressing themselves in stone construction, with sharply peaked dormers on their roofs. Low, wide doors and windows were capped by thick, oblong stone slabs, with sometimes a hood added over the former. A peculiarity frequently found in this type of house was the continuation of the cornice from the eaves horizontally across the ends, so as to make a complete triangle with the gable cornice. In the German colonial architecture, the windows and doors were higher and less wide, while the dormer heads had the same sharp angularity as those of the Welsh. A cornice was seldom carried on the gable ends, which were left unadorned. The peaked roof was common to the houses of the Welsh and German colonists except that the roofs of the latter had less pitch.

While these two types of houses were ordinarily built of stone, the dwellings in New Jersey, although closely following them in architectural design, were often of larger proportions and of brick rather than stone construction. The Pennsylvania Quakers followed the English style at first, but gradually adopted many of the peculiarities of the Welsh and Germans; so that the Pennsylvania colonial farmhouse of to-day is a mixture of the best points of the three styles. In Philadelphia, severity of style was caused by the same strong Quaker in-



1 United States Sub-Treasury, New York City

2 Saint Patrick's Cathedral, New York City

3 Trinity Church, Boston, Mass.

4 Biltmore, N. C.

1 State House, Albany, N. Y. 2 Public Library, Boston, Mass. 3 Eighth Coast Artillery Armory, New York City 4 Woolworth Building, New York City

fluence while the easy access to white marble in considerable quantities made this a favorite material. Hence arose the well-known type of the Philadelphia house, with walls of red brick, white marble lintels, sills and doorsteps, and as the houses were built close to the sidewalk, without areas and with the entrance nearly on a level with the street, a display of solid white painted wooden shutters, which carried out the chromic effect to the full. The population of the South during the colonial period was altogether English as was the architecture, though differing somewhat from the English architecture of New England in that there was no half-timber construction and the chimneys were wholly outside the house, instead of being contained within as in the North. With a natural preference for brick and stone, the earliest southern colonists were compelled to use wood, and though later means of transportation proved adequate for supplying these materials and they were greatly used as soon as the Georgian influence began to be felt, the early dependence on wood created a precedent which has continued until the present time. The cities of the South were less crowded, less busy, more decidedly marked by the distinction between elegant and humble dwellings. In Mobile, Charleston and Savannah, the characteristic dwelling was rather a more stately mansion standing free or nearly so, and having broad verandas or "galleries" which, however, were not turned toward the street, but sidewise upon gardens. Savannah, however, has a very unusual plan: a succession of square, open "places" from each of which four streets lead in four directions, giving a series of square corners and allowing of an irregularity of shape in the house lots which is not known in our other cities. The typical dwelling either in brick or wood was rectangular in plan with the entrance door on one of the long fronts. The shingled or tiled roof, with a chimney at each end, was steeply pitched. The interior consisted either of a ground floor with an attic, or of two living floors with a small storage space above. The entrance house-door opened directly into a large hall quite in contrast with the small entry of New England houses, and this served as a dining- and sitting-room, the kitchen being detached from the house proper. The remainder of the floor was occupied by one or more bedchambers. When the attic was used for domestic purposes it was the custom to light it by long dormer windows with sharp peaked gables.

Architecture expression in the several colonies, however, differed according to locality, but was always informal in its utilitarian consideration of the requirements of early American life. The introduction of Georgian motifs in the second decade of the 18th century was accompanied by a classicism lacking in the earlier folk domiciles of the colonies. In England, and in all the colonies outside of New England, the interpretation was nearly always in brick and stone. In New England, however, clapboards were almost invariably used, though they were sometimes grooved or beveled to imitate cut stone. The New England Puritan character was reflected in many of their domestic and public structures. Comparatively plain on the exterior, the lavishly carved and decorated interior presents the real architectural character of the structure.

In the first phase of the New England Georgian (1714–45) boldness of outline together with a wealth of vigorous carving over the doorways, is strongly reminiscent of the Queen Anne style, and this resemblance is further added to by heavy moldings and flanked pilasters or carved panels. The windows, characteristically tall and narrow, were frequently crowned with a flattened arch in place of the lintel. A rectangular transom of small square lights was often used above the entrance door. The second phase of Georgian architecture (1745–80) in New England witnessed the introduction of more straight lines and the practical elimination of the arch in all except public buildings. Exterior and interior moldings and cornices lost their heaviness and ornamental detail was more restrained. The third phase was strongly influenced in interior and domestic architecture by the Adams Brothers who introduced the Classic Revival (1780–1820). Care and studied design replaced the grossness of earlier work. Columns and pilasters assumed the delicacy and grace so often met with to-day in the architecture of the New England States. During this period Charles Gulfinch in the Massachusetts State House (1795–98) and Samuel McIntire in the Pierce-Nichols house in Salem (1790) did much toward the proper expression of the New England artistic consciousness.

The three Georgian periods in vogue in the colonies from about 1720 to 1805 were more architecturally elaborate in Pennsylvania, New Jersey and Delaware than in New York and New England. Philadelphia, by 1750, the largest and wealthiest city in America, became the focal point around which the architecture of the Middle Colonies centred. Brick and stone were almost invariably employed for exterior construction, while in the interior, carved wood paneling, extending from floor to ceiling, was the usual treatment, though at a later date, damask and elaborate wall paper were often substituted. In the first period, bold but simple ornamental detail, both exterior and interior, combined with strong profile moldings in high relief, resulted in the same heaviness of outline found in New England during the same era. In the second phase, the decorative treatment was lighter and more elaborate, the profiles of moldings being less bold and more graceful, while a close attention to detail indicates more study in the proportion and adaptation of the different classic orders. In the third period, the fireplace which had before extended to the ceiling, under the influence of the English architect, Sir William Chambers, was reduced until it extended but halfway up the wall, but retaining much of its former classic design. Another interesting architectural difference is the decorative point of view during this third and last phase. In the two preceding periods it had been the custom to single out individual features for decorative emphasis; now, the entire front of the house, and often the sides and back as well, were carefully considered and the decorative element extended to the proportions as well as to the detail of the whole. Fan lights, enriched with beautiful metal tracery became common over the doors.

Georgian architecture in the South was usually of brick construction. Kitchens and offices were built apart from the main building, which retained the wide hall and first floor bedrooms of the colonial period. Much study was given to the carved details of staircases, pilasters and pediments. The portico, which later, under the influence of the Classic Revival, assumed the imposing proportions now so familiar to us, was introduced at this time. Amply satisfying, by its dignity and breadth, the demands of the exuberant climate and the affluence of the rich southern landowners, it was, like the architecture of New England and the Middle Colonies, an admirable index of the time and conditions. It was during the latter part of the 18th century that educational, political and humanitarian ideals forced on the national consciousness the necessity for the solution of institutional (prison, asylum and university) problems in a way that no foreign method of arrangement could satisfy. The great exemplar of what might be termed *rational institutional structural philosophy* in the United States was Thomas Jefferson, combining architectural knowledge and political power. The University of Virginia, at Charlotteville (1817) and his design for the Capitol of Virginia at Richmond (1785), boldly adopted from the Maison Carrée at Nimes, are among the most interesting and characteristic productions of the Early Republican Period. The solution of institutional problems found concrete expression in the erection of the New York State Prison (Joseph Mangin, 1796–98) which planned for the separation of the sexes and for criminal classification. The ultimate solution of the problem projected in constructed form by the works of Mangin and Latrobe (the Virginia Penitentiary, 1797–1800, based on the Old World principle of solitary confinement) has been achieved in the new prisons being constructed by the State of New York at Sing Sing and at Wingdale, where the institutions embody in their organization *the function of study of the individual* prisoner. Consult Pilcher, L. F., 'Sing Sing Psychiatric Classification Prison,' (New York 1917).

Between 1776 and 1812, following the firm establishments of national, State and municipal governments, there was an immediate need for public buildings. This demand was affected by the Classical Revival of Europe and was particularly influenced by the intimate relations which had grown up between the New Republic and France. When Washington was selected as the seat of government, it was a Frenchman, Major Pierre Charles l'Enfant, who laid out the city. The Treasury building was the first office building. It was undertaken in 1781. The Treasury, designed by Robert Mills, a pupil of Latrobe, then United States Architect, was built in 1836–39. The same architect also designed the Washington monuments in Baltimore (1815) and Washington (1836). The White House was started in 1792 by James Hoban and a year later the Capitol. The central portion was designed by William Thornton in collaboration with B. H. Latrobe and Charles Bulfinch. It was not until 1851 to 1865 that the dome and wings were added. Other well-known buildings of the Classical Period are the State House and Custom House, Boston, the City Hall, sub-Treasury and Old Custom House, New York City, and the Mint, Philadelphia, the State House, Albany, N. Y. So popular did the monumental style become that buildings sprang up on every side, which, if not completely in the classic mode, were at least adorned with Greek and Roman orders which when applied to small houses served only to make them ridiculous. In large private houses and in public buildings, however, it was possible to do justice to those newly adopted architectural forms and we have many admirably dignified and graceful structures, in the cities of the country. The wave of Roman and Hellenic enthusiasm dominated the architecture of the United States until 1860 when its strength gradually subsided. The style did not live, for architecture to be completely successful must reflect the condition of the civilization whose activities it is planned to house. The impossibility of instilling into modern life the conditioning causes of a dead civilization made it impossible for the structural and decorative elements that were borrowed for the production of Academicism and Classicism to reflect the functioning of the civilization of the 19th century. The Gothic revival of the 19th century while confined chiefly to England made itself manifest in the United States as early as 1839, when Richard M. Upjohn undertook the design and completion (1846) of Trinity Church, New York. Of the same time was the church of Holy Trinity, Brooklyn, N. Y., designed by Lefevre. Grace Church, New York (1840), by James Renwick and, by the same architect, Saint Patrick's Cathedral, New York (1850), are among the most successful efforts of the period. The Gothic style was for the most part restricted to churches, although a few projects as in the Harvard Library and the Yale College Alumni Hall evidence the influence of the collegiate Tudor style of England.

These very creditable pointed works were produced during an era that was otherwise represented by a host of edifices marked by careless and undiscriminating design. The super-excited political conditions that obtained throughout the United States reached their climax in the debâcle of the Civil War and production and art were reciprocally inhibited. Honesty, sobriety of task and logic in construction were in a state of stagnation. The Municipal Building, Philadelphia, and the Capitol, Albany, still unfinished, are monumental expressions of design and construction subordinated to the demands of grasping and voracious political patronage. Their errors of plan and the wholesale disregard of engineering efficiency and sanitary provisions render these costly, unfinishable piles expletives of architectural warning. Perverted taste likewise characterizes the New York Post Office, the Army and Navy Building, Washington, both by A. B. Mullett. In the latter half of the 19th century, the United States experienced unusual activity in building due to a variety of causes, the opening up of the West, the great fires in Boston and New York and the stabilizing of business and finance after the chaotic conditions surrounding the war and reconstruction periods. This new period discovered two architects, Richard M. Hunt and Henry H. Richardson, men thoroughly trained by European study and practical

1 Westover, Va. 2 Monticello, Va. 3 Capitol, Washington, D. C. 4 Saint Paul's Church, New York City

1 Independence Hall, Philadelphia, Pa. 2 Massachusetts State House, Boston, Mass. 3 New York City Hall 4 Washington Monument, Baltimore, Md.

experience and possessed of a personal force that commanded attention, who established in the public mind that architecture was one of the Fine Arts, and set the profession on a sound basis, for Hunt took a leading part in organizing the American Institute of Architects and was its first president. Among his important works are the Lenox Library, Metropolitan Museum of Art and residence of W. K. Vanderbilt, New York, the Breakers and Marble House, Newport, and George W. Vanderbilt's country house at Biltmore. His genius for organized plan, standardization of style and thorough grounding in the principles of the Renaissance finally established that style in the United States.

Henry H. Richardson, a graduate of the Beaux-Arts, and a classicist by training, became dissatisfied with the finical elaborateness of the Gothic revival and turned to the simpler and more massive Romanesque of southern France. His first important work, Trinity Church, Boston, 1877, met with a great and immediate success. So freely did Richardson use the provençal forms, that he may be said to have established a style of his own which is seen to the best advantage in the county buildings, Pittsburgh, the city halls of Albany and Springfield, the public libraries of Woburn, Quincy, Malden and Burlington and the Chamber of Commerce, Cincinnati. His seriousness and refined taste left a lasting impression upon the nation's art, but his selection of the Romanesque style, while it had some following, was abandoned for the Classic and Renaissance due to the influence of the later students of the Ecole des Beaux-Arts. The most important work of this period was the Columbian Exposition at Chicago in 1892. Here the architects were given a free hand in the planning of the grounds and buildings. The result was on a larger scale than had ever been attempted before and showed what could be accomplished by the co-ordination of landscape, architecture, sculpture and painting. Its effect was national, stimulating the imagination of a people long indifferent to claims of beauty and impressing itself upon Federal, State, municipal and commercial buildings for over 25 years. It has also played its part in the development of parks and boulevards and more recently in the reconstruction and artistic planning of cities. It is but natural that a people thus roused to better things in public affairs should display an equal concern in their immediate surroundings and that a similar uplift should be felt in the buildings of domestic character. For the time being it was confined to an adaptation of the old styles to new conditions, the architect seeming more intent in reproducing the old styles than in meeting the needs of the present. In the houses erected in the last 10 years, however, there are evidences of a new creative art that is gradually being established upon the fitness of design, to the locality, climate, materials and the various needs and necessities of modern living. If in the development of his design the architect feels the need of adapting, he is forced to adapt creatively. Thus from the needs of the people, the source of all true art in all time, is gradually being evolved a functional domestic architecture in America to which the experience imagery of the past is being made to contribute. "In this onward movement the Federal buildings, post offices, custom houses, courthouses and other government edifices have not held the first rank. Although solidly and carefully constructed those built during the past 20 years are *inferior* to the best work produced by private enterprise, or by State and municipal governments. This is explained by the fact that all participation in their designing by the leading architects of the country at large has been excluded by enactments devolving upon the Supervising Architect at Washington the planning of all Federal buildings, as well as a burden of Supervision and clerical duties incompatible with the highest artistic results."

During the early part of the 20th century great attention has been given to the problem of the adequate protection of our municipalities and the training of citizen soldiery. The newer principles of military science have been formulated by Major-General O'Ryan and translated into structural form and exemplified in the Eighth Coast Artillery Armory, New York; the First Cavalry Armory, Brooklyn, N. Y.; the Infantry Armory, Troy; Squadron A, Armory, New York; Drill Hall, Cornell University, Ithaca, N. Y. In these typical examples of military architecture the masses and parts of the fabric are so disposed that the attacking force may be seen while the defenders are hidden from sight and at all vulnerable portions of the structure a possiblity provided of obtaining a cross and defile fire. The congestion of population, high cost of land, the perfection of the elevator and the invention of the skeleton or steel frame were the active forces which found their expression in the skyscraper, a product of American ingenuity without a prototype in the whole realm of architecture. In the early periods of its development the same system of adaptation was applied by the architects who failed to recognize the unlimited opportunity afforded by this new problem for the application of the true principles of constructive art. Condemned as a monstrosity and outlawed by the classicists every subterfuge was resorted to in order to conceal the construction and to reduce the apparent height. The World Building and the Manhattan Life Building exemplify the application of this system which may be said to have reached its culmination in the Saint Paul Building where sill and band courses were introduced in the greatest profusion in an effort to accentuate the horizontal and distract the eye from the vertical. The failure of accomplishment along these lines led to a reaction in favor of the frank acknowledgment of height, but limited still in its expression by the traditions of the classic for the accepted principle of composition. The column was taken as the motif of the design of the façade as exemplified in the Broadway Chambers where the capital shaft and base of the column were symbolized in the highly decorated cornice, the repetition of windows and the basement. In the American Surety Building is seen the extreme of this conception in that Bruce Price, the architect, aimed to create the impression of an entasis by varying the depth of the window-reveals through the many stories of the plain shaft. Louis Sullivan was one of the first architects who seems to have recognized the

elementary principles involved in the treatment of this new form, that of expressing upon the exterior the structural members it clothed and protected. Fundamentally, however, classic forms, admittedly changed and modified to meet the new conditions, were the controlling characteristics of the structures of this period. It was not until very recently that the logic of the problem of the tall building was fully grasped and it was realized that the fitting precedent to be followed in a problem in the vertical was to be found in the historical vertical style only. The West Street Building is an exemplification of the Gothic influence which has crystallized in its highest creative state in the Woolworth Building. In passing it is interesting to speculate on the course of this development if the tall building had made its appearance in the days of Upjohn and Renwick. In spite of the great advances that have been made in the development of a creative and scientific architecture, no style has been produced that can as yet be recognized as new or distinctively American. From these advances it may be that we are progessing to the long-looked for American style if such be a possibility within the limits of a national dominion whose climate ranges from the heat of the tropics to the almost arctic conditions of the north temperate zone. Notwithstanding the eclecticism and unprejudiced point of view when the average American comes to judge artistic achievements, no style has been evolved in the United States that is either new or national. Commercial requirements, the demand for speed in design and construction, and the experimental conditionings that restrict the modern designer have discouraged the evolution of a typical national style. In works of a public and commercial character, *the necessity for a co-operative understanding between the architect and the engineer* is increasingly felt. It is only when a *unified resultant* combining the efforts of the architect and the engineer has been achieved — a resultant in which plan and detail shall adequately and truly function with the discoveries of modern science, that a new American style will appear.

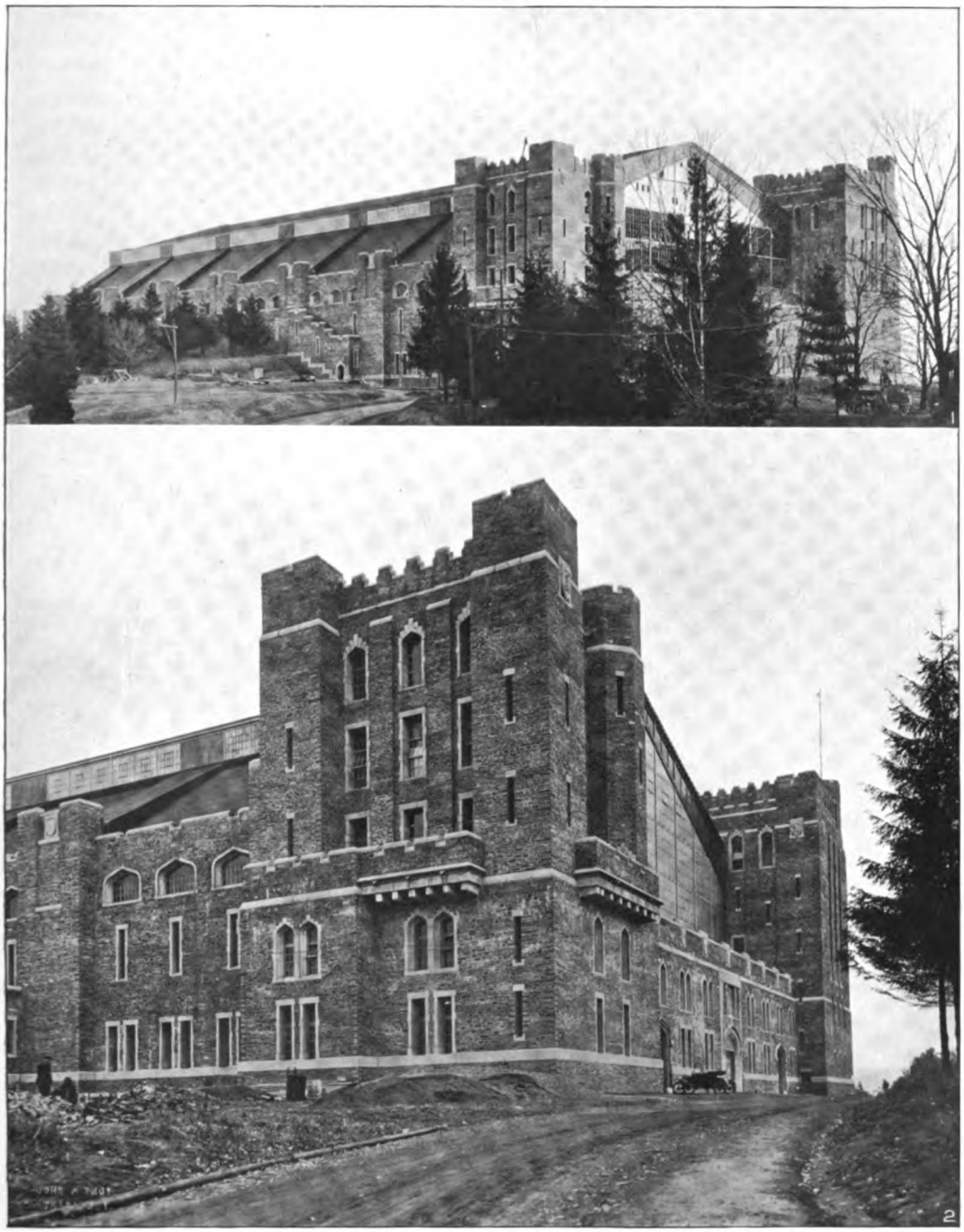
LEWIS F. PILCHER,
State Architect, New York State.

UNITED STATES BOARD OF MEDIATION AND CONCILIATION. See BOARD OF MEDIATION AND CONCILIATION, UNITED STATES.

UNITED STATES OF BRAZIL. See BRAZIL.

UNITED STATES BUREAU OF MINES, a national bureau, whose purpose is the improvement of health conditions and the increase of safety, efficiency and economic development in the mining, quarrying, metallurgic and miscellaneous mineral industries of this country.

UNITED STATES CHRISTIAN COMMISSION, a unique and almost unparalleled association in its origin and operation, which came into existence during the Civil War, for the purpose of promoting the spiritual welfare of the Federal soldiers, sailors, marines, etc., while alleviating, comforting and humanizing their temporal needs. It originated at a convention of the Young Men's Christian Associations of the Northern States, called for the purpose 16 Nov. 1861, in the city of New York, and while the war lasted was in full operation. Its activities became familiar to nearly everyone throughout the entire community and the civilized world, and it received liberal and generous support in voluntary services, money, supplies and literature. The commission met at Washington, D. C., and organized by appointing George H. Stuart as chairman; Hon. B. F. Manierre, treasurer. The commission was located at first in New York, but after the first year in Philadelphia. While the central office of the commission was in Philadelphia important auxiliary branches were organized in all the large cities and towns, whose officials and members were especially active in promoting this great mission of mercy. As the operations of the committee involved large expenditures it was necessary to make proper provision to meet them. From the commencement the finances were carefully managed. The committee resolved to incur no responsibilities which could not be promptly met, and to this rule they steadily adhered. The policy inspired public confidence and contributed not a little to the prosperity and efficiency of the commission. The usual mode of awakening and continuing an interest in its behalf was by spreading information before the people through the religious and secular press, by public meetings, by special appeals and by enlisting the clergy to bring the subject before their congregations. This latter method was productive of large results. Lotteries, raffles and other doubtful means of raising funds, then much in vogue, sensational or clap-trap appeals, were studiously avoided. To select, commission and send forth persons to act as delegates was a most important and delicate duty. These persons represented, on the one hand, the commission and the Christian and patriotic sentiment of the people; and on the other, had to accommodate themselves to the rules of the military and naval service, commend themselves and their work to the officers in charge and minister acceptably to the physical, mental and religious wants of the men. To the appeal of the commission for helpers there was a wholehearted response, and the difficulty arose to make a proper selection from among those who offered their services; 4,859 delegates were commissioned during the war. From its origin to its close the commission had the warm approval of the general government and received every possible facility for carrying out its operations; transportation and telegraph companies assisted and the American Bible and Tract societies donated for distribution thousands of their publications. The cash receipts of the commission during the four years of the war amounted to $2,524,512; the value of the stores donated was $2,839,445; the value of the publications donated was $300,000. Chapels for religious worship and temporary libraries were established in the camps; 136,152 sermons were preached and prayer meetings held, and, among other work, the delegates wrote 92,321 letters and gave the dead Christian burial, also suitably marking the graves of the known dead. Consult 'United States Christian Commission — Facts, Principles, and Progress' (1863); 'Memorial Record of the New York Branch of the



Military Drill Hall, Cornell University

United States Christian Commission' (1866); Moss, 'Annals of the United States Christian Commission' (Philadelphia 1868).

UNITED STATES OF COLOMBIA. See COLOMBIA.

UNITED STATES COMMERCE COURT, a judicial body created by an act of Congress, passed 18 June 1910. The court had jurisdiction, formerly possessed by the United States Circuit Courts, over (1) all cases for the enforcement and collection of forfeitures or penalties and for the infliction of any criminal punishment, other than the payment of money, ordered by the Interstate Commerce Commission; (2) cases brought to annul, suspend or set aside, in whole or in part, any order issued by the Interstate Commerce Commission; (3) any case that was authorized to be maintained in United States Circuit Courts under section 3 of the act entitled, "An Act to further regulate commerce with foreign nations and among the States," approved 19 Feb. 1903; (4) all mandamus proceedings brought under the provisions of section 20 or 23 of the act entitled "An Act to regulate commerce," passed 4 Feb. 1887, such proceedings previously having been maintained in the United States Circuit Court. In all such cases the jurisdiction of the United States Commerce Court was exclusive. It was a court of record composed of a presiding judge and five associate judges, all of whom are appointed by the President of the United States for terms that extend from one to five years. The United States Commerce Court sat permanently in Washington, D. C., although the law permitted it to hold its sessions in any part of the United States that circumstances might make necessary. To invoke its jurisdiction a written petition had to be filed, in which the petitioner's cause of action or ground for release was set forth. The only appeals from its decisions were to the Supreme Court of the United States The judges of this court were appointed by President Taft in December 1910. It organized 8 Feb. 1911 and was opened for business on the 15th. The court developed a reactionary policy. One of its judges was impeached and removed in 1913 and the abolition of the court was demanded by Democrats and Progressives. Taft was responsible for keeping the court in being in 1913, but it was finally abolished on 31 Dec. 1913.

UNITED STATES COPYRIGHT LAW. See COPYRIGHT.

UNITED STATES COURTS. See COURT.

UNITED STATES CUSTOMS COURT, a judicial body which has final jurisdiction over disputed questions concerning the customs. The act under which the Customs Court was created was the Tariff Act of 1909, and the appointments of the five judges constituting this body were made by President Taft in 1910. It removed a class of cases from the Federal Circuit Courts. It was hoped in this way to expedite customs cases and relieve commerce from unnecessary and expensive delays.

UNITED STATES DAUGHTERS OF 1812, National Society of, an organization founded for the purpose of memorializing historical events from the close of the war of the American Revolution to the formation of the United States (as such) and till the close of the second war with Great Britain in 1815, to collect all historical, genealogical and biographical data, to search for and bring to light any valuable documents pertaining to that period and to carefully classify and preserve the same.

This present society is the outcome of the "General Society United States Daughters 1812," founded by Flora Adams Darling in 1892, on the anniversary of the battle of New Orleans, 8 January. Its work begins where that of the Revolutionary commemorative societies leaves off, namely, when the treaty of peace was ratified by the Congress in session on 14 Jan. 1784. The qualifications for membership are: Any woman over 18 years of age, of good character and a lineal descendant of an ancestor who rendered civil, military or naval service during the War of 1812, or the period of the causes which led to that war (subsequent to the War of the Revolution), 14 Jan. 1784 to 2 Nov. 1815, may be eligible to membership, provided the applicant be acceptable to the society. The society was incorporated under Federal laws in 1901. There are about 1,000 members.

UNITED STATES FLYING CORPS. While the United States Marines are the oldest branch (see MARINES, UNITED STATES) of our fighting forces, the United States Flying Corps is our youngest arm. Although the Wright brothers had made successful long distance flights as early as 1905, and France, England and Germany quickly saw the merits of a practical flying machine from the military point of view, the United States was reluctant to expend much time or money on the exploitation of such a new offensive and defensive weapon. And, when war was declared by the United States against Germany, 6 April 1917, in spite of the fact that for over two years the most terrific battles the world ever witnessed were being fought in Europe, and the use of airplanes found a prominent part in the murderous activities, this country's military equipment was without any branch of aviation or practical machines. Even the training powers stood handicapped with but "300 training planes, all of inferior types," the government tells us. But "deliveries of improved models were begun" in June 1917, and by 11 Nov. 1918 (date of armistice) "over 5,800 had been produced, including 1,600 of a type which was temporarily abandoned on account of unsatisfactory engines."

Organization.— The production and operation of military aircraft, when the war started, was under "the Aviation Section of the Signal Corps," created on 18 July 1914. In May 1917 an "Aircraft Production Board was appointed by the Council of National Defense," and in the following October, Congress passed an act creating the "Aircraft Board" in an advisory capacity to the signal corps and the navy. The aviation section of the signal corps was split into two distinct departments in April 1918, with John D. Ryan as head of aircraft production and Brig.-Gen. W. L. Kenly as head of military aeronautics. The Overman bill (which authorized the President to reform and control in matters of aviation) was passed 20 May 1918, and entirely separate bureaus were formed for the production of aircraft and for military

aeronautics, both divorced from the Signal Corps. In August the arrangement was again altered so that the air service came under the control of John D. Ryan as Second Assistant Secretary of War, thus bringing the administration of aviation personnel and equipment under a single head. This matter of fighting, or even reconnoitering, in the atmospheric medium was, therefore, in the nature of an experiment in the United States.

Training of Personnel.—At the outbreak of war there were in the United States two fields in which to teach military aviation — San Diego and Mineola. In another six weeks three others were adopted, "cleared, equipped and made ready for flying," and before the year was passed there were more than a score of aviation fields distributed over all sections of the country in active operation. They have been named in honor of flyers who have been killed in accidents. Thus we have Call Field, Wichita Falls, Tex., named after First Lieutenant L. H. Call, who was killed in an aviation accident, 8 July 1913, at Texas City, Tex.; Chandler Field, Essington, Pa., named after Second Lieutenant Rex Chandler, who was drowned (1913) under his hydro-airplane in San Diego Bay; Ellington Field, Houston, Tex., named after Second Lieutenant E. L. Ellington, who was killed (1913) in an airplane accident at San Diego, Cal.; Gerstner Field, Lake Charles, La., named after Second Lieutenant F. J. Gerstner, who was drowned (1914) at San Diego; Hazelhurst Field, Mineola, L. I., named in honor of Second Lieutenant L. W. Hazelhurst, who was killed (1912) by the fall of his airplane at College Park, Md.; Kelly Field, San Antonio, Tex., named in honor of Second Lieutenant G. E. M. Kelly, who was killed (1911) by an airplane accident at San Antonio, Tex.; Love Field, Dallas, Tex., named after First Lieutenant Moss L. Love, who was killed in an airplane accident (1913) at San Diego; Park Field, Memphis, Tenn., named in honor of First Lieutenant Joseph D. Park, who was killed (1912) in an airplane accident near San Diego; Post Field, Fort Sill, Okla., named in honor of Second Lieutenant Henry B. Post, who was killed (1914) at San Diego in attempting to make an altitude record; Rich Field, Waco, Tex., named in honor of Lieutenant Perry C. Rich, who was killed (1913) by falling into Manila Bay; Rockwell Field, San Diego, Cal., named in honor of Second Lieutenant Lewis G. Rockwell, who was killed (1912) at College Park, Md.; Selfridge Field, Mount Clemens, Mich., named in honor of First Lieutenant Thomas Selfridge, who was killed (1908) while flying at Fort Meyer, Va., as a passenger with Orville Wright, the airplane inventor; Camp Taliaferro, Fort Worth, Tex., named in honor of First Lieutenant Walter R. Taliaferro, who was killed (1915) at San Diego; Scott Field, Belleville, Ill., named in honor of Corporal Scott, who was killed (1912) at College Park, Md., while flying as a passenger. This speedy construction of training fields outstripped the equipment output needed for training, which did not catch up to requirements till the end of 1917, by which time great improvements had been made in training types. (For airplane technique see AEROPLANE). About 17,000 cadets were graduated from ground schools; 8,602 reserve military aviators were graduated from elementary training schools and 4,028 aviators completed the advanced training course. Lacking the machines for specialized advanced practical training the finished course for students was accomplished by sending them to France to finish the course before going into action. The insufficiency of mechanics skilled in the knowledge of airplanes and motors necessitated the establishment of training schools which produced over 14,000 graduated mechanics. The consequence of the intense work of the organization was that when hostilities ceased (11 Nov. 1918) there were 6,528 men training as aviators in the United States consisting of 22 per cent students in ground schools, 37 per cent in elementary schools and 41 per cent in advanced training schools. Aviator mechanics in training numbered 2,154. The number of fliers, including pilots and observers, who were trained abroad, the government informs us, up to 6 Nov. 1918 was approximately 2,300. On 11 Nov. there was the extraordinary total strength in the air service of slightly over 190,000 officers and men, a body of men greater than the United States army at the beginning of the year. These figures constitute slightly over 5 per cent of the total strength of the army, a growth from 65 officers and 1,120 men on America's entrance into the war.

Activities in Europe.— The actual fighting value of all this mighty effort to produce, in unprecedented time, a flying corps that should be worthy the proud war annals of the American military forces in former campaigns, is shown by a short relation of facts given forth from the government's documents. Early in 1918 the first squadrons composed of American personnel appeared at the front. In the absence of any equipment of American production the French provided the airplanes from what stores they could spare. As fast as equipment was increased fresh aviators took to the field. The first airplanes received from the United States arrived in May. In all the American Expeditionary Force received by the date of the armistice 1,379 planes. The first squadron equipped with American planes reached the front in the latter part of July. The first American squadron completely equipped by American production, including airplanes, crossed the German lines on 7 Aug. 1918. On 11 June 1918 American aviators executed their first bombing raid dropping numerous bombs at Dommary-Baroncourt; all airplanes returning in safety. By 30 Sept. there were 32 squadrons at the front; of these 15 were pursuit, 13 observation and four bombing. The final training of the aviators in France necessitated establishing eight different schools under American control, sufficient for 3,800 officers and 11,700 men. These were located as follows for the different kinds of aviation service required on the "firing line": Tours for observers, 916 officers, 2,121 soldiers; Meucon for "artillery firing point," 20 officers, 110 soldiers; Issoudun for general flying, 2,175 officers, 6,100 soldiers; Clermont-Ferrand for bombardment, 120 officers, 1,500 soldiers; Saint Jean-de-Monte for aerial gunners, 92 officers, 1,500 soldiers; Souge for artillery firing point, 259 officers, 750 soldiers; Coetpuidan for artillery firing point, 25 officers, 120 soldiers; Chatillon-sur-Seine for

observers, 204 officers, 373 soldiers. The flying personnel under instruction at date of the armistice (11 Nov.) included 1,323 pilots assigned as follows: Preliminary, 126; advanced, 29; pursuit, 850; observation, 140; day bombing, 77; night bombing, 101. Observers in training included 563 artillery; 65 day bombing; 61 night bombing, being a total of 689 officers, thus producing an aggregate of 2,012 in training. Awaiting instruction was a personnel of 155 pilots and 59 observers. Up to 11 Nov. 1918 graduations included 6,069 pilots divided as follows: Preliminary, 1,573; advanced, 2,359; pursuit, 1,160; observation, 723; day bombing, 77; night bombing, 101. Observers totaled 2,045, divided as follows: Pursuit, 88; artillery, 1,425; day bombing, 390; night bombing, 142. This intensive training to gain an efficiency that should make the flier in air ready for and able to contend against all peculiar dangers and necessities he would encounter in midair was in itself so dangerous and full of risk as to have cost the lives of no less than 159 students of the art through accidents. The number of planes, by type, received by the American Expeditionary Force from all sources between 12 Sept. 1917 and 16 Nov. 1918 was as follows: Pursuit, for service, 3,357; for schools, 90; observation, for service, 3,421; for schools, 664; day bombing, for service, 421; for schools, 90; night reconnaissance, 31. General Pershing on 20 Nov. 1918, stated that a total of 4,045 pursuit, observation and bombing airplanes were in use at the front. Of this number, 2,675 were obtained from France, the others from the United States. The entire air service (including ballooning) in the zone of advance consisted of 2,161 officers, 22,351 soldiers, a total of 24,512 on the actual fighting line; this does not include service of supply. In their details were eight American flying officers with the French armies, 49 officers and 525 soldiers with the British Expeditionary forces; all exclusive of mechanics. All these aerial forces were apportioned to the following divisions in operation: American aero pursuit squadrons, 20; army observation, 5; corps observation, 12; day bombardment, 6; night bombardment, 1; night observation, 1.

Fighting and Casualties.— The exploits of American flying combatants in the World War were first brought before the public view by the quickly celebrated Lafayette Escadrille, composed of a body of young American aviators who, in memory of Lafayette's services to the United States during our War for Independence, volunteered active service in France. It is stated that they had already "brought down" 30 enemy aircraft before America declared war, when they were the first to raise the Stars and Stripes on the western fighting line. They were incorporated with the American Expeditionary Force under the title Lafayette Squadron. This brave group of fighting bird-men was cited by Marshal Pétain thus: "Brilliant unit which has shown itself, during the course of operations in Flanders, worthy of its glorious past. In spite of losses which took away a third of its effectives, in a difficult sector, it has assured a perfect security to our corps observation airplanes, a complete service of reconnaissance at both high and low altitude, and the destruction, not only near the front lines but deep in the enemy's territory, of a great number of German airplanes and captive balloons." The early make-up of this little band of intrepid fliers contained William Thaw, Norman Prince, Kiffen Rockwell, Elliott Cowdin, Bert Hall and Victor Chapman. The grave of the latter was discovered in April 1919 where he fell "flying inside the German lines during Crown Prince's Verdun offensive in the Spring of 1916." Another phase of Allies co-operating with our flying corps is given in a government report: "During the last weeks of the Allied offensive, ... squadrons of de Haviland 9's from both British and American air forces, were bombing military objectives in the German towns back of the Hun lines every day and night. Despite the opposition put up by the German air squadrons and anti-aircraft batteries, this was particularly true in the neighborhood of Saarbrucken, Kaiserslautern, Treves and Mannheim. Here the British and American planes often had to fight their way 100 miles to their objective through squadron after squadron of fighting Hun machines, and then, after dropping their bombs, have to fight their way back the whole 100 miles to their own lines." The casualty list at the front, although somewhat higher than that of the artillery and infantry rate, is considered a small one compared with the total strength. Up to 24 Oct. 1918 fatal accidents and battle losses amounted to 244 on the European fields. Statistics show, however, that two aviators lost their lives, on an average, in accidents for each aviator killed in battle. Quentin Roosevelt, 65th Aero Squadron, fell fighting 14 July 1918. A table of casualties "on the front" gives the following figures: One hundred and seventy-one killed in combat; 135 taken prisoners; 129 wounded; 73 missing; 42 killed in accidents; other causes 4; a total of 554. The rapidity with which the casualty list grew with the advance in the fighting is contained in the following figures: March 1918, two; April, none; May, 27; June, 29; July, 65; August, 82; September, 181; October, 125; November 1st to 11th, 43. Some idea of the gigantic scale and complexity of tactics into which the activities of the aviation arm were developing can be seen from such a description as that at Messines Ridge. In this wonderful encounter we have the following battle formation: A squadron of fighting planes near the earth armed with guns for attacking troops in the trenches, transports, etc.; above, at a height of from 3,000 to 5,000 feet was a division of bombing machines to attack the enemy lines, and, at an elevation of 15,000 to 20,000 feet, were chasing machines for attacking enemy bombers which might attempt to drop bombs from above on the Allied bombers. Many pages of the War Department's Air Service *Weekly News Letter* are filled with a great number of very daring successful exploits of the individual flyers "cited for distinguished service" such as First Lieut. Frank Baer's (103 Aero Pursuit Squadron), who "brought down enemy planes on April 5, 12 and 23, 1918. On 21 May 1918, his record reached an eighth enemy plane." George R. Phillips, pilot, 50 Aero Squadron, at La Morthomme, 23 Oct. 1918, "attacked an enemy balloon and forced it to descend and was in turn attacked by three enemy planes.

The incendiary bullets from the enemy's machines set the signal rockets in the observer's cockpit afire. Disregarding the possibility of going down in flames, Lieutenant Phillips maneuvered his plane so that his observer was able to fire on and destroy one enemy plane and drive the others away. He then handed his fire extinguisher to Lieut. L. Brown (observer), who extinguished the flames. They completed their mission and secured other valuable information.» Second Lieut. L. Glen A. Preston, field artillery observer, 99th Aero Observation Squadron, cited for heroism in action near Andevanne. Separated, on a photographing expedition, from his protecting planes and continuing alone, he was attacked by seven Fokkers; he drove them off and secured numerous photographs. Next day he accomplished his mission though disputed by encounters with four separate enemy formations, one of 58 machines, another of 6, another of 7, then a formation of biplanes. He shot down one of the enemy. Capt. Edward V. Rickenbacker, 94th Aero Squadron, is credited with destroying 26 enemy machines. Those aviators who bring down five or more are unofficially termed «Aces»; Rickenbacker is justly given the title of «Ace of Aces.» He gained his Distinguished Service Cross in October 1918. One extra bar was for voluntary patrol heroism near Billy when he attacked seven enemy planes (five, type Fokker, protecting two, type Halberstadt). He dived on them and shot down one of the Fokkers, then attacked a Halberstadt and sent it down. But the most astonishing meteoric career in the history of the Flying Corps was that of Second Lieut. Frank Luke, 27th Aero Squadron. In 17 days he shot down 18 enemy machines, then met a tragic death. Alone he attacked three «Drachen» observation balloons, was cut off by 10 enemy planes, engaged them all, got two of them, then escaped by pretending he was disabled. His counterfeit «fall» started above the balloons, of which he shot all three in flames, then was heard of no more. Some peasants say he landed alive and was shot to death by the Germans. This extraordinary Phœnix, Ariz., boy, had reached but 20 years when his brave life was snuffed out against all the laws of war. Consult Sweetser, 'The American Air Service' (New York 1919).

CLEMENT W. COUMBE,
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UNITED STATES INDIAN TRAINING AND INDUSTRIAL SCHOOL, at Carlisle, Pa. It was established on the present site in 1879, but its real beginning was in 1875, when 74 Indians were brought as prisoners of war to Fort Marion, Saint Augustine, Fla. When put to work at the fort they proved intelligent and trustwortny, and their skill as workmen aroused the interest of some of the women of Saint Augustine, who established a school for them and taught them English. In 1878, when their term of confinement was over, 22 asked to stay in the East to attend school, 17 of whom were placed at Hampton Institute; Capt. R. H. Pratt of the United States army was then authorized to bring 50 more Indians from the Dakota reservation to Hampton. He soon found that a separate school for the Indians was desirable, and the abandoned army post at Carlisle was assigned for the uses of a school in 1879. In October of that year he brought the first Indian pupils to Carlisle. The aim of the school has always been to prepare the Indians to take part in the life of a civilized community as citizens on an equality with other citizens, and thus to free them from especial and separate supervision. The courses offered are of elementary and secondary grade, and are grouped about four central subjects, the English language, history and literature, science, and form and number (including geometry and algebra). There are also excellent music and art departments. A normal department was organized in 1894 and provides instruction in psychology (elementary), pedagogics, history of education, and methods of teachings sloyd, with practice work. The industrial work is a prominent feature, half the school day being devoted to some productive industry. Instruction and practice is given in carpentry, blacksmithing, painting, harness-making, tinsmithing, shoe-making, laundry work, hospital and nurse work, sewing, household and domestic economy (including special course in bread-making), farming and dairying. Another important part of the work is the systematic physical training, gymnastic classes being arranged for boys and girls in all grades; athletic sports are also encouraged, and the football team has a national reputation for excellent playing. The most distinctive feature of the school is the "outing system," by which the school requires all its students to spend at least one year in some white family under the supervision of the school. During the winter they attend the public school in their neighborhood, and when not in school receive regular wages for work on the farm or in the home; a portion of these wages is placed in the school bank and draws interest. This system, which has been in force since the beginning of the schools, has proved eminently successful; the Indians have been pleasantly welcomed in the homes to which they go, and have proved themselves, as a rule, helpful and congenial members of the family. Over 800 pupils are sent out every summer, and about half that number remain out every winter. The aim of this system is to enable the Indians to gain direct, personal experience in self-support by honest work, and an insight into the responsibilities and amenities of civilized family and institutional life in its best and most attractive forms. The united earnings of the students who were working outside, in 1909, amounted to about $40,000. A weekly paper, *The Red Man and Helper*, is printed in the school shop by Indians. The school is under the control of the Indian Office of the United States government, and is supported by government appropriation. The students in 1910 numbered 1,075; the total enrolment since the beginning was more than 7,000.

UNITED STATES AND MACEDONIAN, Battle of, in the War of 1812. On 8 Oct. 1812 Stephen Decatur (q.v.) sailed from Boston with his frigate *United States* (rated as a 44 but carrying 32 long 24's and 22 short 42's) and on 25 October was chased by the British frigate *Macedonian* (rated as a 38 but carrying 28 long 18's, 18 short 32's, 1 long 12 and 2 long 9's), Capt. John S. Carden. The long 24's on the broadside of the *United States* so out-

weighed the long 18's of the *Macedonian's* broadside that 10 minutes after the battle began the scene on the *Macedonian* was indescribably confused and horrible. Carden then bore down to engage in close fighting, but the carronades of the American vessel got into play and worked fearful havoc, shooting away the masts and rigging and silencing many of the guns of the British frigate. At 11 o'clock the *United States* passed out of range to refill cartridges and repair a few minor injuries, whereupon the British crew, believing the Americans had given up the fight, set a union jack and gave three cheers. But the *United States* soon resumed the fight, taking a raking position across the stern of her defenseless foe, and at 11.15 compelled her to strike, just an hour and a half after the action began. The *Macedonian* lost 104 killed and wounded and the *United States* 12. Decatur sent the *Macedonian* to New London — the only British frigate ever brought as a prize into an American port — and she was later sent to New York where, after repairs, she was placed under command of Capt. Jacob Jones (q.v.) of the *Wasp* (q.v.). At City Island, New York, her cabin and other portions of the ship now form part of the Macedonia Inn. Consult 'American State Papers, Naval Affairs' (Vol. I, pp. 280–281); Barnes, James, 'Naval Actions of the War of 1812' (pp. 59–70); Brady, C. T., 'Life of Stephen Decatur' (pp. 72–84); James, William, 'Naval Actions' (pp. 18–21); Maclay, E. S., 'History of the Navy' (Vol. I, pp. 374–391); Mahan, A. T., 'War of 1812' (Vol. I, pp. 416–422); Roosevelt, 'Naval War of 1812' (p. 109 et seq); Spears, J. R., 'History of Our Navy' (Vol. II, pp. 120–151); Waldo, S. P., 'Life of Decatur' (pp. 189–196); Wiley and Rines, 'The United States' (Vol. V, pp. 466–468).

UNITED STATES OF MEXICO. See MEXICO.

UNITED STATES MILITARY ACADEMY, a national institution at West Point, N. Y., for the education of officers for the regular army, organized in 1802. Candidates for admission must be 17–22 years old, at least five feet four inches in height at 17, five feet five inches at 18 and upward, of good moral character and free from anything that would render them unfit for military service. They must pass a severe medical examination, and an examination in reading, writing, orthography, arithmetic, elements of grammar, descriptive geography, and the history of the United States. The course is four years, the pay is $848.20 per annum; an oath of allegiance is required of each cadet, also a pledge to serve the United States for eight years after graduation unless sooner discharged. Admission is secured by appointment of the President of the United States. Each congressional district may now send two cadets, two also may come from each territory, four from the District of Columbia, two from natives of Porto Rico, four from each State at large and 80 from the United States at large, 20 of whom are selected from among the honor graduates of educational institutions having officers of the regular army detailed as professors of military science and tactics under existing law. The President is authorized to appoint cadets from among enlisted men of 19–22 years old who have served not less than one year, provided that the total number so selected shall not exceed 180 at any one time. The annual increments are, therefore: States at large, 21; congressional districts, 92; Alaska, District of Columbia, Porto Rico, Hawaii (combined), 1 each year to the source longest without an appointment; honor schools, 5; regular army, 23 in 1919; National Guard, 23 in 1919. The appointments from a congressional district are made upon the recommendation of the representative in Congress from that district, and those from a State at large upon the recommendations of the senators of the State. In general the appointments from each territory, honor school, etc., are made upon the recommendation of the highest authority in that territory, school, etc. Candidates are nominated as many as possible one year before admission. Those nominated are admitted either by examination or by certificate that the candidate is a regularly enrolled student in good standing in a university, college or technical school accredited by the United States Military Academy, provided that the entrance requirements of the course he is pursuing require proficiency in subjects amounting to not less than 14 units of the academy examinations. A military staff assists the superintendent. The requirements for admission were raised in 1902. Classes at the academy are divided into groups of from 7 to 12 cadets and to each group is assigned an instructor. This arrangement makes it imperative for the cadet to prepare for recitation every day in every subject of his course and in this manner the authorities have an adequate check on his progress from day to day. At the end of the course of four years cadets of the highest standing are recommended for all the corps of the army, especially the engineers; while those of lower standing are sent to the cavalry, field artillery, infantry, etc., but never to the engineers. No vacations are granted for the first two years. A five-day furlough is granted to cadets who have maintained a worthy record. During the World War graduations of the first and second classes were advanced, the latter by almost a full year.

The course of instruction, which is very thorough, requires four years, and is largely mathematical and professional. The principal subjects are mathematics, English, French, drawing, drill regulations of all arms of the service, natural and experimental philosophy, chemistry, chemical physics, mineralogy, geology, electricity, history, international constitutional and military law, Spanish, civil and military engineering, art and science of war, ordnance and gunnery. From 15 June to about 30 August cadets live in camp, engaged only in military duties and receiving practical military instruction. There are 126 persons on the military and academic staffs of the academy and 927 cadets. The whole number of cadets graduated from 1802 to 1918, inclusive, has been 6,028. See ARMY SCHOOLS; MILITARY EDUCATION.

UNITED STATES NATIONAL MUSEUM, a national depository for scientific and historical collections under the administration

of the Smithsonian Institution (q.v.), located at Washington, D. C. The beginning of the museum was Smithson's cabinet of minerals, and other collections gathered by exploring expeditions, which had been placed under the charge of the Smithsonian Institution by the act establishing it in 1846. The name of United States National Museum was not adopted until 1876, when the Smithsonian Institution added to the collections already made the exhibits prepared to illustrate the resources and ethnology of the United States at the Centennial Exhibition, together with a large amount of material presented by 34 foreign nations. In 1879 Congress appropriated $250,000 for a museum building; but this has for some time been inadequate for the proper housing of the collections, and a new building was provided for in 1903 by the appropriation of $3,500,000. The chief means of adding to the collection are by the specimens gathered by government explorations and surveys, by exchanges, by gift, and by limited purchases provided for in the Congressional appropriation. The museum is under the general direction of the secretary of the Smithsonian Institution, and under the special charge of an assistant secretary and curators, appointed by the secretary; and receives an annual appropriation from the government. Its collections are naturally best for matters relating to North America; the material illustrating the arts and occupations of the American Indians and the fisheries of the United States is particularly valuable; and the historical collections containing personal relics of famous Americans are interesting. The museum publishes 'Proceedings' and an 'Annual Report,' containing scientific articles describing or illustrating the collections; aid is also given to students in using the collections for purposes of scientific research.

UNITED STATES NAVAL ACADEMY. See NAVAL ACADEMY, UNITED STATES.

UNITED STATES NAVAL OBSERVATORY, The. See NAVAL OBSERVATORY, THE UNITED STATES.

UNITED STATES NAVAL RESERVE FORCE. When the United States entered the European War, it became evident that in having both "National Naval Volunteers" and the United States Naval Reserve Force, the national government was maintaining two organizations in peace to accomplish the same end of providing reserve man power for the navy in war. To continue to carry on both could produce only a duplication of effort with a double overhead of cost and personnel for training. It was seen that individual State effort as exemplified in the militia would result in providing a number of miniature navies and that Naval Militia, even though it could change to National Naval Volunteers, was the lesser efficient of the two methods of developing trained man power. It was, therefore, decided to work out a means of amalgamating the "Volunteers" with the "Reserve Force." To effect the amalgamation it was necessary to give special consideration to the former naval militiamen. These men, at great personal sacrifice and expense, had for years been giving their time and energy to their State organizations and, without much aid from the national government, had done much to prepare themselves for the government service in time of war. They were entitled to some reward for their untiring devotion and, in fairness, the organizations they had so laboriously built up could not be totally destroyed without a hearing. Accordingly the highest ranking and oldest officers of the militia were called into conference to determine the ways and means of amalgamation. The conferences went off smoothly and the officers called in met the situation fairly. Seeing the national good coming therefrom, they quickly agreed to the practical obliteration of the organization they had taken so long to build and in close harmony with the department assisted in drawing up a law transferring their personnel to the United States Naval Reserve Force. The law as drawn up was recommended to Congress for passage and was enacted in the bill approved 1 July 1918. By this act the navy was believed to be in good organization so far as providing training and utilizing man power is concerned. See NAVAL MILITIA.

UNITED STATES NAVAL WAR COLLEGE. See NAVAL ACADEMY, UNITED STATES.

UNITED STATES NAVY. See UNITED STATES — NAVY OF THE.

UNITED STATES PRESIDENTIAL CANDIDATES. Since the establishment of the government of the United States there have been several important changes in the method of electing the candidates for the offices of President and Vice-President. Prior to 1804, for example, each elector voted for two candidates for the Presidency. The one who received the largest number of votes was then declared elected, while the candidate receiving the second largest electoral vote filled the office of Vice-President. Thus as the electoral vote at the first election showed 69 ballots for George Washington and 34 for John Adams, General Washington became the first President of the new republic, while the defeated Adams was declared its Vice-President.

During the first quarter of a century of its national existence practically no "direct" vote was cast for the election of the two chief executives of the United States. Instead of selecting the electors by a "direct" vote — as is the case at the present day — in nearly all States, the electors were "appointed" by the legislature, a fact which makes it extremely difficult, if not absolutely impossible, to obtain any accurate figures which might indicate the strength of popular opinion at any of the national elections prior to 1824, by which time the choice of electors by the "direct" vote of the people had become general throughout the Union.

It was not until 1804 that electors cast their vote for both a President and a Vice-President instead of for the two candidates for the Presidency, for it was during Thomas Jefferson's first term that this matter was so widely agitated that a necessary Constitutional amendment was adopted providing for the methods of election which now prevail in all parts of the country.

Although, from an official point of view, there is no such thing as a popular vote for the election of President and Vice-President the ballots cast in the various States for the several electors is always regarded as the "direct"

expression of popular opinion, and as the number of such electors are apportioned among the several States upon a basis in keeping with the growth of population it is not strange that the popular vote and the electoral vote should not always agree in their results. In 1824, for example, as in 1888, the candidate who was defeated by the electoral college was the one who had received the largest "direct" vote. So, too, in 1876, when the dispute over the electoral vote of several of the Southern States was referred to the Congressional electoral committee, the choice of Hayes defeated Tilden, a man who had received almost 300,000 more votes from the people.

PRESIDENTIAL CANDIDATES OF THE UNITED STATES, 1789–1916.

Election year	Name of candidate	State represented	Party represented	Electoral vote	Popular vote	State and date of birth	State and date of death
1789	George Washington	Va.	.....	69	.....	Va., 22 Feb. 1732	Va., 14 Dec. 1799
	John Adams	Mass.	.....	34	.....	Mass., 30 Oct. 1735	Mass., 4 July 1826
	John Jay	N. Y.	.....	9	.....	N. Y., 12 Dec. 1745	N. Y., 17 May 1829
	R. H. Harrison	Md.	.....	6	.....	Md., ——— 1745	Md., 2 April 1790
	John Rutledge	S. C.	.....	6	.....	S. C., ——— 1739	S. C., 23 July 1800
	John Hancock	Mass.	.....	4	.....	Mass., 12 Jan. 1737	Mass., 8 Oct. 1793
	George Clinton	N. Y.	.....	3	.....	N. Y., 26 July 1739	D. C., 20 April 1812
	Samuel Huntington	Conn.	.....	2	.....	Conn., ——— 1732	Conn., 5 Jan. 1796
	John Milton	Ga.	.....	2	.....	Ga., ——— 1740	
	James Armstrong	Ga.	.....	1	.....	.....	Pa., 3 Sept. 1795
	Benjamin Lincoln	Mass.	.....	1	.....	Mass., 24 Jan. 1733	Mass., 9 May 1810
	Edward Telfair	Ga.	.....	1	.....	Va., ——— 1735	Ga., 17 Sept. 1807
1792	George Washington	Va.	Fed.	132	.....	(Above)	(Above)
	John Adams	Mass.	Fed.	77	.....	(Above)	(Above)
	George Clinton	N. Y.	Rep.	50	.....	(Above)	(Above)
	Thomas Jefferson	Va.	Rep.	4	.....	Va., 2 April 1743	Va., 4 July 1826
	Aaron Burr	N. Y.	Rep.	1	.....	N. J., 6 Feb. 1756	N. Y., 14 Sept. 1836
1796	John Adams	Mass.	Fed.	71	.....	(Above)	(Above)
	Thomas Jefferson	Va.	Rep.	68	.....	(Above)	(Above)
	Thomas Pinckney	S. C.	Fed.	59	.....	S. C., 23 Oct. 1750	S. C., 2 Nov. 1828
	Aaron Burr.	N. Y.	Rep.	30	.....	(Above)	(Above)
	Samuel Adams	Mass.	Rep.	15	.....	Mass., 27 Sept. 1722	Mass., 2 Oct. 1803
	Oliver Ellsworth	Conn.	Ind.	11	.....	Conn., 29 April 1745	Conn., 26 Nov. 1807
	George Clinton	N. Y.	Rep.	7	.....	(Above)	(Above)
	John Jay	N. Y.	Fed.	5	.....	(Above)	(Above)
	James Iredell	N. C.	Fed.	3	.....	N. C., 2 Nov. 1788	N. C., 13 April 1853
	George Washington	Va.	Fed.	2	.....	(Above)	(Above)
	John Henry	Md.	Fed.	2	.....	Md., ——— 1750	Md., 16 Dec. 1798
	S. Johnson	N. C.	Fed.	2	.....	——— ———1733	N. C., 18 Aug. 1816
	C. C. Pinckney	S. C.	Fed.	1	.....	S. C., 25 Feb. 1746	S. C., 16 Aug. 1825
1800	Thomas Jefferson	Va.	Rep.	73	.....	(Above)	(Above)
	Aaron Burr	N. Y.	Rep.	73	.....	(Above)	(Above)
	John Adams	Mass.	Fed.	65	.....	(Above)	(Above)
	C. C. Pinckney	S. C.	Fed.	64	.....	(Above)	(Above)
	John Jay	N. Y.	Fed.	1	.....	(Above)	(Above)
1804	Thomas Jefferson	Va.	Rep.	162	.....	(Above)	(Above)
	C. C. Pinckney	S. C.	Fed.	14	.....	(Above)	(Above)
1808	James Madison	Va.	Rep.	122	.....	Va., 27 Aug. 1751	Va., 6 Mar. 1836
	C. C. Pinckney	S. C.	Fed.	47	.....	(Above)	(Above)
	George Clinton	N. Y.	Rep.	6	.....	(Above)	(Above)
1812	James Madison	Va.	Rep.	128	.....	(Above)	(Above)
	DeWitt Clinton	N. Y.	Fed.	89	.....	N. Y., 2 Mar. 1769	N. Y., 11 Feb. 1826
1816	James Monroe	Va.	Rep.	183	.....	Va., 28 April 1758	N. Y., 4 July 1831
	Rufus King	N. Y.	Fed.	34	.....	Me., 24 Mar. 1755	N. Y., 29 April 1827
1820	James Monroe	Va.	Rep.	228	.....	(Above)	(Above)
	John Quincy Adams	Mass.	Rep.	1	.....	Mass., 11 July 1767	D. C., 23 Feb. 1848
1824	John Quincy Adams	Mass.	Rep.	84	108,740	(Above)	(Above)
	Andrew Jackson	Tenn.	Dem.	99	153,544	N. C., 15 Mar. 1767	Tenn., 8 June 1845
	W. H. Crawford	Ga.	Rep.	42	47,136	Va., 12 April 1777	D. C., 29 June 1852
	Henry Clay	Ky.	Rep.	37	46,618	Va., 24 Feb. 1772	Ga., 15 Sept. 1834
1828	Andrew Jackson	Tenn.	Dem.	178	647,286	(Above)	(Above)
	John Quincy Adams	Mass.	Nat. Rep.	83	508,064	(Above)	(Above)
1832	Andrew Jackson	Tenn.	Dem.	219	687,502	(Above)	(Above)
	Henry Clay	Ky.	Nat. Rep.	49	530,189	(Above)	(Above)
	John Floyd	Ga.	Ind.	11	.....	Va., ——— 1770	Va., 16 Aug. 1837
	William Wirt	Md.	Anti-Mas.	7	.....	Md., 8 Nov. 1772	D. C., 18 Feb. 1834
1836	Martin Van Buren	N. Y.	Dem.	170	762,678	N. Y., 5 Dec. 1782	N. Y., 24 July 1862
	William H. Harrison	Ohio	Whig	73	.....	Va., 9 Feb. 1773	D. C., 4 April 1841
	Hugh L. White	Tenn.	Whig	26	735,651	N. C., ——— 1773	Tenn., 10 April 1840
	Daniel Webster	Mass.	Whig	14	.....	N. H., 18 Jan. 1782	Mass., 24 Oct. 1852
	W. P. Mangum	N. C.	Whig	11	.....	N. C., ——— 1792	N. C., 14 Sept. 1861
1840	William H. Harrison	Ohio	Whig	234	1,275,016	(Above)	(Above)
	Martin Van Buren	N. Y.	Dem.	60	1,129,102	(Above)	(Above)
	James G. Birney	N. Y.	Liberty	.....	7,069	Ky., 4 Feb. 1792	N. J., 25 Nov. 1857
1844	James K. Polk	Tenn.	Dem.	170	1,337,243	N. C., 2 Nov. 1795	Tenn., 15 June 1849
	Henry Clay	Ky.	Whig	105	1,299,062	(Above)	(Above)
	James G. Birney	N. Y.	Liberty	.....	62,300	(Above)	(Above)
1848	Zachary Taylor	La.	Whig	163	1,360,099	Va., 24 Sept. 1784	D. C., 9 July 1850
	Lewis Cass	Mich.	Dem.	127	1,220,544	N. H., 9 Oct. 1782	Mich., 17 June 1866
	Martin Van Buren	N. Y.	F. S.	.....	291,263	(Above)	(Above)
1852	Franklin Pierce	N. H.	Dem.	254	1,602,274	N. H., 23 Nov. 1804	N. H., 8 Oct. 1869
	Winfield Scott	N. J.	Whig	42	1,386,580	Va., 13 June 1786	N. Y., 29 May 1866
	John P. Hale	N. H.	Free Dem.	.....	155,825	N. H., 31 Mar. 1806	N. H., 19 Nov. 1873
	Daniel Webster	Mass.	Whig	.....	1,670	(Above)	(Above)

PRESIDENTIAL CANDIDATES OF THE UNITED STATES, 1789–1916 — *Concluded.*

Election year	Name of candidate	State represented	Party represented	Electoral vote	Popular vote	State and date of birth	State and date of death
1856	James Buchanan	Pa.	Dem.	174	1,838,169	Pa., 22 April 1791	Pa., 1 June 1868
	John C. Fremont	Cal.	Rep.	114	1,341,264	Ga., 21 Jan. 1813	N. Y., 13 July 1890
	Millard Fillmore	N. Y.	Amer.	8	874,534	N. Y., 7 Feb. 1800	N. Y., 8 Mar. 1874
1860	Abraham Lincoln	Ill.	Rep.	180	1,866,452	Ky., 12 Feb. 1809	D. C., 15 April 1865
	J. C. Breckinridge	Ky.	Dem.	72	847,953	Ky., 21 Jan. 1821	Ky., 17 May 1875
	Stephen A. Douglas	Ill.	U. Dem.	39	1,375,157	Vt., 23 April 1813	Ill., 3 June 1861
	John Bell	Tenn.	Cons. U.	12	590,631	Tenn., 15 Feb. 1797	Tenn., 10 Sept. 1869
1864	Abraham Lincoln	Ill.	Rep.	212	2,213,665	(Above)	(Above)
	George B. McClellan	N. J.	Dem.	21	1,802,237	Pa., 3 Dec. 1826	N. J., 29 Oct. 1885
1868	Ulysses S. Grant	Ill.	Rep.	214	3,012,833	Ohio, 27 April 1822	N. Y., 23 July 1885
	Horatio Seymour	N. Y.	Dem.	80	2,703,249	N. Y., 31 May 1810	N. Y., 12 Feb. 1886
1872	Ulysses S. Grant	Ill.	Rep.	286	3,597,132	(Above)	(Above)
	Horace Greeley	N. Y.	D. & L.	.....	2,834,125	N. H., 3 Feb. 1811	N. Y., 29 Nov. 1872
	Charles O'Conor	N. Y.	Dem.	.....	29,489	N. Y., 22 Jan. 1804	Mass., 12 May 1884
	James Black	Pa.	Temp.	.....	5,608	Pa., 23 Sept. 1823	Pa., 16 Dec. 1893
	Thomas A. Hendricks	Ind.	Dem.	42	.....	Ohio, 7 Sept. 1819	Ind., 25 Nov. 1885
	B. Gratz Brown	Mo.	Dem.	18	.....	Ky., 28 May 1826	Mo., 13 Dec. 1885
	Charles J. Jenkins	Ga.	Dem.	2	.....	S. C., 7 Jan. 1805	Ga., 13 June 1883
	David Davis	Ill.	Ind.	1	.....	Md., 9 Mar. 1815	Ill., 26 June 1886
1876	Rutherford B. Hayes	Ohio	Rep.	185	4,036,298	Ohio, 4 Oct. 1822	Ohio, 17 Jan. 1893
	Samuel J. Tilden	N. Y.	Dem.	184	4,300,590	N. Y., 9 Feb. 1814	N. Y., 4 Aug. 1886
	Peter Cooper	N. Y.	Greenback	.....	81,737	N. Y., 12 Feb. 1791	N. Y., 4 April 1883
	Green Clay Smith	Ky.	Pro.	.....	9,522	Ky., 2 July 1832	Ky., 29 June 1895
	James B. Walker	Ill.	Amer.	.....	2,636	Pa., 29 July 1805	Ill., 6 March 1887
1880	James A. Garfield	Ohio	Rep.	214	4,454,416	Ohio, 19 Nov. 1831	N. J., 19 Sept. 1881
	Winfield S. Hancock	Pa.	Dem.	155	4,444,952	Pa., 14 Feb. 1824	N. Y., 9 Feb. 1886
	James B. Weaver	Iowa.	Greenback	.....	308,578	Ohio, 12 June 1833	
	Neal Dow	Me.	Pro.	.....	10,305	Me., 20 Mar. 1804	Me., 2 Oct. 1897
	John W. Philips	Vt.	Amer.	.....	707	Vt., 13 Nov. 1813	30 June 1900
1884	Grover Cleveland	N. Y.	Dem.	219	4,874,986	N. J., 18 Mar. 1837	N. J., 24 June 1908
	James G. Blaine	Me.	Rep.	182	4,851,981	Pa., 31 Jan. 1830	D. C., 27 Jan. 1893
	John P. St. John	Ky.	Pro.	.....	150,369	Ind., 25 Feb. 1833	
	Benjamin F. Butler	Mass.	People's	.....	175,370	N. H., 5 Nov. 1818	D. C., 11 Jan. 1893
	P. D. Wigginton	Cal.	Amer.	.....	.....		
1888	Benjamin Harrison	Ind.	Rep.	233	5,439,853	Ohio, 20 Aug. 1833	Ind., 13 Mar. 1901
	Grover Cleveland	N. Y.	Dem.	168	5,540,309	(Above)	(Above)
	Clinton B. Fisk	N. J.	Pro.	.....	249,506	N. Y., 8 Dec. 1828	N. Y., 9 July 1890
	Alson J. Streeter	Ill.	Union L.	.....	146,935	N. Y., ——— 1823	Ill., 24 Nov. 1901
	James L. Curtis	N. Y.	Amer.	.....	1,591	Conn., 19 Feb. 1816	
1892	Grover Cleveland	N. Y.	Dem.	277	5,554,437	(Above)	(Above)
	Benjamin Harrison	Ind.	Rep.	145	5,175,287	(Above)	(Above)
	James B. Weaver	Iowa	People's	22	1,041,028	(Above)	(Above)
	John Bidwell	Cal.	Nat. Dem.	.....	264,133	N. Y., 5 Aug. 1819	Cal., ——— 1900
	Simon Wing	Mass.	Pro.	.....	21,164		
1896	William McKinley	Ohio	Rep.	271	7,102,272	Ohio, 29 Jan. 1843	N. Y., 14 Sept. 1901
	William J. Bryan	Neb.	Dem. & Peo.	176	6,273,624	Ill., 19 Mar. 1860	
	John M. Palmer	Ill.	Nat. Dem.	.....	133,148	Ky., 13 Sept. 1817	Ill., 25 Sept. 1900
	Joshua Levering	Md.	Pro.	.....	132,007	Md., 12 Sept. 1845	
	Charles H. Matchett	N. Y.	Soc. L.	.....	36,274	Mass., 15 May 1843	
	Charles E. Bentley	Neb.	Nat.	.....	13,969	N. Y., 30 April 1841	
1900	William McKinley	Ohio	Rep.	292	7,219,101	(Above)	(Above)
	William J. Bryan	Neb.	Dem. & Peo.	155	6,357,054	(Above)	(Above)
	John G. Woolley	Ill.	Pro.	.....	208,187	Ohio, 15 Feb. 1850	
	Eugene V. Debs	Ind.	Soc. Dem.	.....	99,613	Ind., 5 Nov. 1855	
	Wharton Barker	Pa.	M. R. P.	.....	51,585	Pa., 1 May 1846	
	Joseph F. Malloney	Mass.	Soc. L.	.....	33,413	R. I., ——— 1863	
	Seth H. Ellis	Ohio	U. R.	.....	5,698	Ohio, 3 Jan. 1830	
	J. F. R. Leonard	Iowa	U. C.	.....	1,059	Pa., 10 Dec. 1832	
1904	Theodore Roosevelt	N. Y.	Rep.	336	7,624,982	N. Y., 27 Oct. 1858	N. Y., 6 Jan. 1919
	Alton B. Parker	N. Y.	Dem.	140	5,112,565	N. Y., 14 May 1852	
	Eugene V. Debs	Ind.	Soc.	.....	406,442	(Above)	(Above)
	Silas C. Swallow	Pa.	Pro.	.....	258,838	Pa., 5 May 1839	
	Thomas E. Watson	Ga.	People's	.....	120,903	Ga., 5 Sept. 1856	
	Charles H. Corregan	N. Y.	Soc. L.	.....	28,943	N. Y., 11 Dec. 1860	
1908	William Howard Taft	Ohio	Rep.	231	7,678,908	Ohio, 15 Sept. 1857	
	William J. Bryan	Neb.	Dem.	162	6,409,104	Ill., 19 March 1860	
	Eugene V. Debs	Ind.	Soc.	.....	420,793	Ind., 5 Nov. 1855	
	Eugene W. Chafin	Ariz.	Pro.	.....	253,840	Wis., 1 Nov. 1852	
	Thomas E. Watson	Ga.	People's	.....	29,100	Ga., 5 Sept. 1856	
	August Gillhaus	N. Y.	Soc. L.	.....	13,825	——— ———	
	Thomas L. Hisgen	Mass.	Ind.	.....	82,872	Ind., 26 Nov. 1858	
1912	Woodrow Wilson	N. J.	Dem.	435	6,293,019	Va., 28 Dec. 1856	
	William Howard Taft	Ohio	Rep.	8	3,484,956	Ohio, 15 Sept. 1857	
	Theodore Roosevelt	N. Y.	Prog.	88	4,119,507	N. Y., 27 Oct. 1858	N. Y., 6 Jan. 1919
	Eugene V. Debs	Ind.	Soc.	.....	901,873	Ind., 5 Nov. 1855	
	Eugene W. Chafin	Ariz.	Pro.	.....	207,928	Wis., 1 Nov. 1852	
	Arthur E. Reimer	Mass.	Soc. L.	.....	29,259	——— ———	
1916	Woodrow Wilson	N. J.	Dem.	277	9,129,269	Va., 28 Dec. 1856	
	Charles E. Hughes	N. Y.	Rep.	254	8,547,328	N. Y., 11 April 1862	
	Allan L. Benson	N. Y.	Soc.	.....	590,579	Mich., 6 Nov. 1871	
	J. Frank Hanly	Ind.	Pro .	.....	221,329	Ill., 4 April 1863	
	Arthur E. Reimer	Mass.	Soc. L.	.....	14,180	——— ———	

VICE-PRESIDENTIAL CANDIDATES OF THE UNITED STATES, 1804–1916.

Year	Name of candidate	State represented	Party represented	Electoral vote	State and date of birth	State and date of death
1804	George Clinton	N. Y.	Rep.	162	N. Y., 26 July 1739	D. C., 20 April 1812
	Rufus King	N. Y.	Fed.	14	Me., 24 Mar. 1755	N. Y., 29 April 1827
1808	George Clinton	N. Y.	Rep.	113	(Above)	(Above)
	Rufus King	N. Y.	Fed.	47	(Above)	(Above)
	John Langdon	N. H.	Fed.	9	N. H., —— 1739	N. H., 18 Sept. 1819
	James Madison	Va.	Rep.	3	Va., 27 Aug. 1751	Va., 6 Mar. 1836
	James Monroe	Va.	Rep.	3	Va., 28 April 1758	N. Y., 4 July 1831
1812	Elbridge Gerry	Mass.	Rep.	131	Mass., 17 July 1744	D. C., 23 Nov. 1814
	Jared Ingersoll	Pa.	Fed.	86	Conn., ——— 1749	Pa., 31 Oct. 1822
1816	D. D. Tompkins	N. Y.	Rep.	183	N. Y., 21 June 1774	N. Y. 11 June 1825
	John E. Howard	Md.	Fed.	22	Md., 4 June 1752	Md., 12 Oct. 1827
	James Ross	Pa.	.....	5	Pa., 12 July 1762	Pa., 27 Nov. 1847
	John Marshall	Va.	.....	4	Va., 24 Sept. 1755	Pa., 6 July 1835
	Robert G. Harper	Md.	.....	3	Va., ——— 1765	Md., 15 July 1825
1820	D. D. Tompkins	N. Y.	Rep.	215	(Above)	(Above)
	Richard Stockton	N. J.	.....	8	N. J., 1 Oct. 1750	N. J., 28 Feb. 1821
	Daniel Rodney	Del.	.....	4	——— ——— 1771	Del., 2 Sept. 1846
	Robert G. Harper	Md.	.....	1	(Above)	(Above)
	Richard Rush	Pa.	.....	1	Pa., 29 Aug. 1780	Pa., 30 July 1859
1824	John C. Calhoun	S. C.	Dem.	182	S. C., 18 Mar. 1782	D. C., 31 Mar. 1850
	Nathan Sanford	N. Y.	Rep.	30	N. Y., 5 Nov. 1779	N. Y., 17 Oct. 1838
	Nathaniel Macon	N. C.	Rep.	24	N. C., ——— 1757	N. C., 29 June 1837
	Andrew Jackson	Tenn.	Dem.	13	N. C., 15 Mar. 1767	Tenn., 8 June 1845
	Martin Van Buren	N. Y.	Dem.	9	N. Y., 5 Dec. 1782	N. Y., 24 July 1862
	Henry Clay	Ky.	Rep.	2	Va., 12 April 1777	D. C., 29 June 1852
1828	John C. Calhoun	S. C.	Dem.	171	(Above)	(Above)
	Richard Rush	Pa.	Nat. Rep.	83	(Above)	(Above)
	William Smith	N. C.	Dem.	7	N. C., ——— 1762	Ala., 26 June 1840
1832	Martin Van Buren	N. Y.	Dem.	189	(Above)	(Above)
	John Sergeant	Pa.	Nat. Rep.	49	Pa., 5 Dec. 1779	Pa., 25 Nov. 1852
	Henry Lee	Mass.	Ind.	11	Mass., 4 Feb. 1782	Mass., 6 Feb. 1867
	Amos Ellmaker	Pa.	Anti-Masonic	7	Pa., 2 Feb. 1787	Pa., 28 Nov. 1851
	William Wilkins	Pa.	Dem.	30	Pa., 20 Dec. 1779	Pa., 23 June 1865
1836	Richard M. Johnson	Ky.	Dem.	147	Ky., 17 Oct. 1780	Ky., 19 Nov. 1850
	Francis Granger	N. Y.	Whig	77	Conn., 1 Dec. 1792	N. Y., 28 Aug. 1868
	John Tyler	Va.	Whig	47	Va., 29 Mar. 1790	Va., 18 Jan. 1862
	William Smith	Ala.	Dem.	23	(Above)	(Above)
1840	John Tyler	Va.	Whig	234	(Above)	(Above)
	Richard M. Johnson	Ky.	Dem.	48	(Above)	(Above)
	L. W. Tazewell	Va.	Dem.	11	Va., 17 Dec. 1774	Va., 6 Mar. 1860
	James K. Polk	Tenn.	Dem.	1	N. C., 2 Nov. 1795	Tenn., 15 June 1849
	Thomas Earle	Pa.	Liberty	.....	Mass., 21 April 1796	Pa., 14 July 1849
1844	George M. Dallas	Pa.	Dem.	170	Pa., 10 July 1792	Pa., 31 Dec. 1864
	T. Frelinghuysen	N. J.	Whig	105	N. J., 28 Mar. 1787	N. J., 12 April 1862
	Thomas Morris	Ohio	Liberty	.....	Va., 3 Jan. 1776	Ohio, 7 Dec. 1844
1848	Millard Fillmore	N. Y.	Whig	163	N. Y., 7 Feb. 1800	N. Y., 8 Mar. 1874
	William O. Butler	Ky.	Dem.	127	Ky., ——— 1791	Ky., 6 Aug. 1880
	Charles F. Adams	Mass.	F. Soil	.....	Mass., 18 Aug. 1807	Mass., 21 Nov. 1886
1852	William R. King	Ala.	Dem.	254	N. C., — April 1786	Ala., — April 1853
	William A. Graham	N. C.	Whig	42	N. C., 5 Sept. 1804	N. Y., 11 Aug. 1875
	George W. Julian	Ind.	F. Dem.	.....	Ind., 5 May 1817	Ind., 7 July 1899
1856	J. C. Breckenridge	Ky.	Dem.	174	Ky., 21 Jan., 1821	Ky., 17 May 1875
	William L. Dayton	N. J.	Rep.	114	N. J., 17 Feb. 1807	France, 1 Dec. 1864
	A. J. Donelson	Tenn.	Amer.	8	Tenn., 25 Aug. 1800	Tenn., 26 June 1871
1860	Hannibal Hamlin	Me.	Rep.	180	Me., 27 Aug. 1809	Me., 4 July 1891
	H. V. Johnson	Ga.	Dem.	12	Ga., 18 Sept. 1812	Ga., 16 Aug. 1880
	Joseph Lane	Ore.	Dem.	72	N. C., ——— 1801	N. C., 19 April 1881
	Edward Everett	Mass.	Union	39	Mass., 11 April 1794	Mass., 15 Jan. 1865
1864	Andrew Johnson	Tenn.	Rep.	212	N. C., 29 Dec. 1808	Tenn., 31 July 1875
	George H. Pendleton	Ohio	Dem.	21	Ohio, 25 July 1825	Belg'm, 24 Nov. 1889
1868	Schuyler Colfax	Ind.	Rep.	214	N. Y., 23 Mar. 1823	Minn., 13 Jan. 1885
	F. P. Blair, Jr.	Mo.	Dem.	80	Ky., 19 Feb. 1821	Mo., 9 July 1875
1872	Henry Wilson	Mass.	Rep.	286	N. H., 16 Feb. 1812	D. C., 22 Nov. 1875
	B. Gratz Brown	Mo.	D. & L.	47	Ky., 28 May 1826	Mo., 13 Dec. 1885
	John Quincy Adams	Mass.	Dem.	.....	Mass., 22 Sept. 1833	Mass., 14 Aug. 1894
	John Russell	Mich.	Temp.	.....		
	George W. Julian	Ind.	Liberty	5	(Above)	(Above)
	A. H. Colquitt	Ga.	Dem.	5	Ga., ——— 1824	D. C., 26 March. 1894
	John M. Palmer	Ill.	Dem.	3	Ky., 13 Sept. 1817	Ga., ——— 1894
	T. E. Bramlette	Ky.	Dem.	3	Ky., 3 Jan. 1817	Ky., 12 Jan. 1875
	W. S. Grocabeck	Ohio	Dem.	1	N. Y., 24 July 1815	Ky., 12 Jan. 1875
	Willis B. Machen	Ky.	Dem.	1	Ky., 5 April 1810	Ky., 29 Sept. 1893
	N. P. Banks	Mass.	Liberty	1	Mass., 30 Jan. 1816	Mass., 1 Sept. 1894
1876	William A. Wheeler	N. Y.	Rep.	185	N. Y., 30 June 1819	Mass., 1 Sept. 1894
	T. A. Hendricks	Ind.	Dem.	184	Ohio, 7 Sept. 1819	N. Y., 4 June 1887
	Samuel F. Cary	Ohio	Greenback	.....	Ohio, 18 Feb. 1814	Ind., 25 Nov. 1885
	Gideon T. Stewart	Ohio	Pro.	.....	N. Y., 7 Aug. 1824	
	D. Kirkpatrick	N. Y.	Amer.	.....		
1880	Chester A. Arthur	N. Y.	Rep.	214	Vt., 5 Oct. 1830	N. Y., 18 Nov. 1886
	William H. English	Ind.	Dem.	155	Ind., 27 Aug. 1822	Ind., 7 Feb. 1896
	B. J. Chambers	Tex.	Greenback	.....		
	H. A. Thompson	Ohio	Pro.	.....	Pa., 23 Mar. 1837	
	S. C. Pomeroy	Kan.	Amer.	.....	Mass., 3 Jan. 1816	Kan., 27 Aug. 1891
1884	T. A. Hendricks	Ind.	Dem.	219	(Above)	(Above)
	John A. Logan	Ill.	Rep.	182	Ill., 9 Feb. 1826	D. C., 26 Dec. 1886
	William Daniel	Md.	Pro.	.....	Md., 24 Jan. 1826	Md., 13 Oct. 1822
	A. M. West	Miss.	Greenback	.....		

VICE-PRESIDENTIAL CANDIDATES OF THE UNITED STATES, 1804–1916 — *Continued.*

Year	Name of candidate	State represented	Party represented	Electoral vote	State and date of birth	State and date of death
1888	Levi P. Morton	N. Y.	Rep.	233	Vt., 16 May 1824	
	Allen G. Thurman	Ohio	Dem.	168	Va., 13 Nov. 1813	Ohio, 12 Dec. 1895
	John A. Brooks	Mo.	Pro.	.....	Pa., 17 June 1814	Pa., 26 March 1893
	C. E. Cunningham	Ark.	Union L.	.....		
	W. H. T. Wakefield	Kan.	United L.	.....		
	James B. Greer	Tenn.	Amer.	.....		
1892	Adlai E. Stevenson	Ill.	Dem.	277	Ky., 23 Oct. 1835	Ill., 15 June 1914
	Whitelaw Reid	N. Y.	Rep.	145	Ohio, 27 Oct. 1837	London, 15 Dec. 1912
	James G. Field	Va.	People's	.....	Va., ——— 1839	
	James B. Cranfill	Tex.	Pro.	.....		
	Charles H. Matchett	N. Y.	Soc. L.	.....	Mass., 15 May 1843	
1896	Garret A. Hobart	N. J.	Rep.	271	N. J., 3 June 1844	N. J., 21 Nov. 1899
	Arthur Sewall	Me.	Dem.	149	Me., 25 Nov. 1835	Me., 5 Sept. 1900
	Thomas E. Watson	Ga.	People's	27	Ga., 5 Sept. 1856	
	Hale Johnson	Ill.	Pro.	.....	Ind., 21 Aug. 1847	
	Simon B. Buckner	Ky.	Nat. Dem.	.....	Ky., 1 April 1823	
	Matthew Maguire	N. J.	Soc. L.	.....	N. Y., ——— 1850	
	James H. Southgate	N. C.	Nat.	.....	Va., 12 July 1859	
1900	Theodore Roosevelt	N. Y.	Rep.	292	N. Y., 27 Oct. 1858	N. Y., 6 Jan. 1919
	Adlai E. Stevenson	Ill.	Dem.	155	(Above)	(Above)
	Henry B. Metcalf	R. I.	Pro.	.....	Mass., ——— 1829	R. I., 10 Oct. 1904
	Ignatius Donnelly	Minn.	People's	.....	Pa., 3 Nov. 1831	Minn., 2 Jan. 1901
	Job Harriman	Cal.	Soc. D.	.....	Ind., 15 Jan. 1861	
	Valentine Remmel	Pa.	Soc. L.	.....		
	John G. Woolley	Ill.	U. C.	.....	Ohio, 15 Feb. 1850	
	Samuel T. Nicholson	Pa.	U. R.	.....	N. C., 2 Feb. 1852	
1904	Charles W. Fairbanks	Ind.	Rep.	336	Ohio, 11 May 1852	Ind., 3 June 1918
	Henry G. Davis	W. Va.	Dem.	140	Md., 16 Nov. 1823	D. C., 11 Mar. 1916
	George W. Carroll	Tex.	Pro.	.....	La., 11 April 1855	
	Thomas H. Tibbles	.....	People's	.....	Ohio, 22 May 1838	
	Benjamin Hanford	N. Y.	Soc.	.....	Ohio, ——— 1858	
	William W. Cox	Ill.	Soc. L.	.....	Ill., 5 Feb. 1864	
1908	James S. Sherman	N. Y.	Rep.	321	N. Y., 24 Oct. 1855	N. Y., 30 Oct. 1912
	John W. Kern	Ind.	Dem.	162	Ind., 20 Dec. 1849	Ind., 17 Aug. 1917
	Benjamin Hanford	N. Y.	Soc.	.....	Ohio, —— 1856	
	Aaron S. Watkins	Ohio	Pro .	.....	Ohio, 29 Nov. 1863	
	Samuel Williams	Ind.	Peoples	.....		
	Donald, L. Munro	Va.	Soc. L.	.....		
	John Temple Graves	Ga.	Ind.	.....	S. C., 9 Nov. 1856	
1912	Thomas R. Marshall	Ind.	Dem.	435	Ind., 14 Mar. 1854	
	Nicholas M. Butler	N. Y.	Rep.	8	N. J., 2 April 1862	
	James S. Sherman *	N. Y.	Rep.	.....	(Above)	(Above)
	Hiram W. Johnson	Cal.	Prog.	88	Cal. 2 Sept. 1866	
	Emil Seidel	Wis.	Soc.	.....	Pa., 13 Dec. 1864	
	Aaron S. Watkins	Ohio	Pro.	.....	(Above)	(Above)
	August Gillhaus	N. Y.	Soc. L.	.....		
1916	Thomas R. Marshall	Ind.	Dem.	277	(Above)	
	Charles W. Fairbanks	Ind.	Rep.	254	Ohio, 11 May 1852	Ind., 3 June 1918
	George R. Kirkpatrick	N. J.	Soc.	.....		
	Ira Landrith	Mass.	Pro.	.....	Tex., 23 March 1865	
	Caleb Harrison	Ill.	Soc. L.	.....		

* Died before meeting of Electoral College. Republican votes cast for Mr. Butler, substitute nominee.

UNITED STATES RECLAMATION SERVICE, a bureau of the Department of the Interior of the United States government created by Act of Congress, 17 June 1902, for the purpose of survey, examination, construction and operation of works for the reclamation by irrigation of arid and semi-arid lands. Funds were provided by the Act by setting aside the proceeds of the disposal of public lands which from 1902 to 1919 aggregated nearly $100,000,000. This amount with the greater part of an additional loan of $20,000,000 — or in round numbers approximately $120,000,000 have been spent up to 1919 in works for conservation and distribution of water supply in the western part of the United States. Among the most notable of these works are the Roosevelt dam and canals in Arizona, distributing water to the valley lands in the vicinity of Phœnix: the Arrowrock dam in Idaho; the Elephant Butte dam in New Mexico; the Gunnison tunnel in Colorado and many other works. See HYDRAULIC ENGINEERING.

The Reclamation Service as originally created was unique among government organizations in that it had a continuing fund and was independent of annual appropriations. It thus could make plans for carrying out its work in consecutive order through several years as is necessary in ordinary business affairs and could give full consideration to the requirements of efficiency and economy. Since 1915, however, definite appropriations for each project have been made annually by Congress.

Origin of the Service.— The necessity for this law arose from the fact that the western two-fifths of the United States consists in great part of public land. The conditions of aridity are such that only a very small portion of this land can be utilized for agriculture. Attempts made by individuals and organizations to irrigate the lands, while successful from an agricultural standpoint and from that of the development of the country, were not profitable to the investor, hence development and the use of the resources of the West were not progressing rapidly. It became appreciated about 1900 that further progress could not be expected without direct effort on the part of the Federal government, the owner of the great body of the arid public lands. The objections to making direct appropriations for improving these

lands was met by the ingenious plan proposed by the late Senator, then Representative, Francis G. Newlands, of Nevada to the effect that money derived from the disposal of portions of the land should be used in reclaiming other portions.

Organization.— The Reclamation Service was an outgrowth of the work of the United States Geological Survey. The latter bureau was authorized by Congress, in March 1888, to investigate the extent to which the arid region might be reclaimed, this action being taken largely through the effort of the then director, Maj. John Wesley Powell. The investigations were made by what was known as the Hydrographic Branch, measurements of water supply in many streams being begun and also surveys of possible reservoir sites. The information thus obtained and widely diffused laid the foundations for a presentation of the needs and opportunities of water conservation and furnished the facts for action by Congress taken in accordance with the recommendation of President Theodore Roosevelt in his first message in 1901. As organized immediately on passage of the Act 17 June 1902, the work was under a chief engineer who continued in charge, under the director of Geological Survey, until 1907, when the service became a separate bureau and the chief engineer was made director, reporting to the Secretary of the Interior. Because of widely separated location of the work, in 17 Western States, and their remoteness from lines of transportation, it became necessary to develop an organization where the largest possible discretion might be exercised by the men in the field, at the same time securing proper uniformity and compliance with governmental regulations. This was brought about by having five supervising engineers each in charge of work in a group of States where the climatic conditions were similar. Under these were project engineers in responsible charge of each particular piece of work and with general authority to execute these works according to plans agreed upon in advance after conference with various technical advisers or consulting engineers as well as the chief and supervising engineers. Under this system of locally placed and carefully defined authority and responsibility, operations proceeded with a rapidity and skill seldom found in governmental bureaus where the tendency has been toward excessive centralization of authority and development of so-called "red tape." Modifications of the system were made during the years 1914–16 by placing the authority in the hands of five commissioners located at Washington — the number being later reduced to three, the offices of the supervising engineer being abolished and the project engineers reporting directly to Washington, later to a more central point at Denver, and with a gradual return to former and more efficient methods. The organization has since been placed again under one head, the director and chief engineer, located at Washington, D. C., with a chief of construction at Denver, Colo.

Under the original organization plans were made during the years 1902–07 for works whose completion has required all of the funds which would be available from the proceeds of the disposal of public lands for a decade or more — the plans being so drawn as to permit expansion to the full limit of the available water supply in each locality. The work was undertaken in such manner as to enable completed portions of each project to be utilized before all parts were finished. It was also considered wise to start work on a broad basis in a number of localities rather than concentrate it in a few places because by so doing a more nearly normal growth of each project was possible. This is in contrast to the attempts made by private investors to complete one large project and then operate it as a whole without having had the advantage of experience acquired through the slow growth of the component parts. Most of the works thus planned from 1902–07 have been brought to a degree of completion such that a large part of the land is being utilized. The appropriations now made annually by Congress from the reclamation funds are utilized to finish these works.

Works Built.— The principal works are those for storage of flood or waste waters and for conducting the waters thus made available from the natural streams to the lands to be watered. Besides the large storage dams there have been built many diversion dams in the rivers, turning the water into large canals built in rock or earth. These divide and subdivide into smaller distributaries or laterals leading to each farm. To control the water, gates are provided in the canals and at each outlet; also flumes and occasionally pipe lines, bridges and culverts for road crossings, as well as many other structures. The following table gives a recapitulation of the more important of these:

TABLE I. BRIEF SUMMARY OF CONSTRUCTION RESULTS.
[To 30 June 1919.]

Item	Unit	Number or quantity
CONSTRUCTIONS		
Dams		100
Canals, ditches and drains	Miles	12,314
Tunnels	Miles	27
Dikes or levees	Miles	97
Irrigation and drain pipe	Miles	500
Flumes	Miles	120
Canal lining (concrete)	Miles	307
Roads	Miles	970
Railroads	Miles	83
Telephone lines	Miles	3,126
Transmission lines	Miles	615
Canal structures		97,145
Bridges		7,000
Culverts		9,044
Buildings		1,374
MATERIALS HANDLED		
Excavation:		
Earth	Cubic yards	154,473,487
Indurated	Cubic yards	9,913,065
Rock	Cubic yards	8,409,772
Total	Cubic yards	172,796,274
Volume placed in dams:		
Masonry	Cubic yards	2,087,991
Earth	Cubic yards	10,720,671
Rockfill and crib	Cubic yards	1,203,386
Total		13,512,048
Riprap	Cubic yards	1,892,728
Paving	Square yards	819,408
Concrete	Cubic yards	3,023,446
Cement	Barrels	2,971,330

Economic Problems.— The object of the expenditure which has been made from the reclamation fund is to provide water for lands which without it would be incapable of producing valuable crops. The original intention was to take the water to lands belonging to the United States. It was found, however, that individuals taking advantage of various land laws had already obtained possession of the lands which might be irrigated to an extent such that it was impracticable to discriminate and hence lands which had formerly been in public ownership were included in the reclamation projects, the requirements being enforced that no one landowner should be permitted to obtain water from the government works for an area larger than that adequate for the support of a family and not to exceed 160 acres.

Although the government advanced the money and built the works, it is intended that the lands benefited shall ultimately return the cost in 10, or as later amended 20, annual instalments without interest. It is also required that until this amount is paid the owner must live upon the land or in the vicinity, the intention being to prevent as far as possible absentee landlordism, and to give the preference to those men and their families who are actually seeking a home, as distinguished from an opportunity for investment or speculation.

The liberal terms offered and the fact that the government was undertaking the work attracted all kinds of people, including both competent and incompetent. There is no provision by which selection can be made of persons who are qualified by strength or experience to carry on an irrigated farm. As a result a considerable number of adventurers or restless people seized upon the opportunity in the hopes of getting from the government something for nothing and of selling out later at a profit. It followed that in the settlement of these lands there has been some shifting of population, although probably less than in the case of privately built projects. This condition seems to prevail in most new countries where no systematic or well-planned effort has been made to control the character of settlement. Under the Reclamation Act it was not lawful to designate in advance the qualifications of the homestead entryman or the purchaser of a farm unit irrigated at government expense. The assumption of the law has been in general that each citizen should have an equal opportunity without discrimination. Experience has shown that better results might perhaps have been obtained had it been practicable to set certain conditions of physical and financial ability and experience in handling an irrigated farm. In this connection, however, it is interesting to note from a recent investigation on several reclamation projects, that the average number of settlers to a farm unit ranged from 1.14 where conditions were favorable to 1.68 where conditions were unfavorable, with a general average of 1.49; showing, for Federal projects at least, that there is little basis for the statement so often made that "throughout the newer parts of America at least three settlers in succession attempt to develop a farm before one succeeds."

Assuming that the government gets back its investment or the greater part of it, there is no question but that the risk has been justified, even though the interest and a large part of principal is lost. The lands irrigated are situated in the more remote and sparsely settled parts of the United States and their occupation makes possible the development of other industries and the utilization of natural resources which otherwise might be untouched. There is thus a large indirect gain not merely in material prosperity, but in building up communities of producers whose efforts contribute not merely to the wealth of the nation, but more than this to the production of more vigorous types of citizenship. For crops in this region see DRY FARMING.

FREDERICK H. NEWELL,
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UNITED STATES SANITARY COMMISSION, The. An organization appointed by the United States government during the Civil War, and co-operating with it in promoting the health, comfort and efficiency of the armies. It also gave aid to the navy. At the outbreak of the war, the Quartermaster, Commissary and Medical Departments of the regular army were inexperienced in caring for large bodies of men, in active service, the last war (Mexican) being in 1846–48. The medical staff could not properly initiate or execute sanitary work, as by custom, hospital construction and the transportation of sick and wounded belong to the Quartermaster Department, and the regulation of diet to the Commissary. Inspection and the means for giving aid were imperfect. The war prevailed from 12 April 1861 to 9 April 1865. On 15 April 1861 President Lincoln called for 75,000 volunteers, believing they would be required for only a few months. But in July of the same year 800,000 more were called for, later 300,000 and in 1864 500,000. Of this army of over 1,000,000 men (with 15,000 regulars) 350,000 died during the war, thousands were crippled by wounds and ailments. About 190,000 of the deaths were from sickness, mainly scurvy, dysentery, diarrhœa, erysipelas and general debility, the result of insufficient sleep, clothing and food, exposure, hard marches and poor drinking water. In the early part of the war, before drafting was resorted to, one-eighth of the volunteers were in their 19th year and three-fourths were under 30 years of age.

Realizing that to do the most good there must be co-operation in a definite plan, under the auspices of the government, Rev. Dr. Bellows and Dr. Elisha Harris called a public meeting at Cooper Institute. At this meeting it was decided "to collect and disseminate information upon the actual and prospective wants of the army, to establish recognized relations with the medical staff and act as auxiliary to it, to maintain a central depot of stores and open a bureau for the examination and registration of nurses."

Drs. Van Beuren and Harsen, representing two prominent New York medical associations, suggested to General Scott that diseased men and mere boys should be discharged from the army. Comparatively few were discharged. The surgeon-general was asked to reorganize the medical staff and if possible have its sanitary powers increased. This was not done. In May 1861 the government was appealed to to

appoint a commission of civilians, medical men and army officers, to co-operate with the Medical Bureau (or to act independently of it) in an investigation as to preventable diseases of hospitals and camps. On 9 June 1861 the government appointed "a commission of inquiry and advice in respect of the sanitary condition of the United States forces." The commission was to serve without pay, but had a furnished room allotted it in Washington and was "to ascertain the sanitary condition of volunteers, to suggest means to preserve and restore health, and to insure the general comfort and efficiency of troops, such as proper cooks, nurses, hospitals, etc., and to correspond freely with the War Department and the Medical Bureau."

The United States Sanitary Commission organized 12 June 1861 with Rev. Dr. Bellows as president. Relief was to be subordinate to prevention and advice, the conclusions of the commission must "be approved by the Medical Bureau, ordered by the War Department and carried out by officers and men." The six inspectors of camps appointed found inefficient drains and police duty, overcrowded tents, offensive sinks, personal uncleanliness, poor and filthy clothing, badly cooked food and a scarcity of green vegetables. By persistent efforts of the commission these deficiencies were gradually remedied to a large extent. But it was difficult at first to raise sufficient money for preventive measures, though life insurance companies responded nobly. Later, when the work broadened, railroad, telegraph and express companies gave their services and with the people at large contributed abundantly. Cash receipts to 1 May 1866 were $4,962,014.26, and of branch treasuries nearly $2,000,000 more. Supplies furnished during the war were valued at $15,000,000.

Before the war there was no general hospital, only tent hospitals, the largest containing 40 beds. In July 1861 the commission suggested well-equipped general hospitals in pavilion form, and that these should be built under the direction of the Medical Department, which should also arrange for the transportation of the sick and wounded and attend to their diet. The relief system was divided into general and special relief, the first attending to the wants of the inmates of general, field and regimental hospitals, and of men in camp and on the march, the second cared for the sick and needy at military depots, discharged men, paroled prisoners and irregulars. The various agents of the commission were paid a moderate salary, it being found best not to rely upon volunteer agents. With each army was a medical inspector, relief agents, wagons and horses, transports if necessary and a supply depot at the base.

The special relief service cared for men on their way to and from the front, in 40 "Homes," "Rests" and "Lodges" at various points; acted as attorneys in obtaining back pay and pensions; kept the inmates under surveillance that no danger might befall them; paid their way home when necessary, established feeding stations, where hot soup and coffee were always ready and cared for discharged prisoners at parole camps and the motley crowd of substitutes, stragglers, deserters, etc., at convalescent camps, affording comforts, information and opportunities to communicate with their families. The Auxiliary Relief Corps, organized in 1864, cared for the wounded and sick sent to the depot field hospitals in the rear of large armies and also for those left behind by an army in its onward march. It furnished food, stimulants, underclothing and reading matter, communicated with the soldiers' friends, obtained express packages and provided in many instances burial. Other work was accomplished by the commission. Medical tracts, on subjects relating to army life, prepared by experts, were distributed to army surgeons. A Hospital Directory (main office in Washington, branches in other cities) was established, recording entrances, transfers and dismissals. In 1863 a "free pension and war claim agency" was founded. Over $2,500,000 of back pay and pensions amounting to $7,500,000 were obtained for discharged soldiers, at a saving to the beneficiaries of thousands of dollars.

Valuable statistics were published in pamphlet form, embracing the effects on soldiers of marches, the rate of recruiting required for the losses of war, measurements of soldiers, the number of sick in various regiments and the causes of sickness, etc. The success of the commission was due to the influence of popular ideas, American civilization and thorough organization, although it had much to contend with in the way of governmental red tape and deficiencies and the bad will of State agencies.

UNITED STATES STEEL CORPORATION, The. An industrial organization formed in 1901 by the amalgamation of the Carnegie Steel Company, the Federal Steel Company, the National Tube Company, the American Steel and Wire Company, the National Steel Company, the American Tin Plate Company, the American Sheet Steel Company, the American Steel Hoop Company, the Lake Superior Consolidated Iron Mines and the American Bridge Company. These 10 merged companies had an aggregate capital of $867,550,394, of which $459,936,694 was common stock, $247,613,700 preferred, and $160,000,000 bonds. Elbert H. Gary, president of the Federal Company, Andrew Carnegie, owner of the Carnegie Company, Charles M. Schwab, a Carnegie official, and J. P. Morgan, banker, were the principal figures in effecting the consolidation. In the new company a capital of $500,000,000 each in common and preferred stocks was authorized, together with $304,000,000 in bonds, making a total of $1,304,000,000. The syndicate which financed the transaction, headed by the Morgan interests, advanced $25,000,000 in cash as working capital. In less than a year from its foundation the stockholders of the old companies had exchanged their holdings for stock of the new corporation.

The steel-producing equipment controlled by this gigantic corporation comprised 149 steel works of various kinds, having an annual capacity of 9,400,000 tons of crude and about 7,700,000 tons of finished steel; 78 blast furnaces with a pig-iron capacity of 7,400,000 tons; over 50,000 acres of coking coal lands; over 1,000 miles of railroad; a fleet of 112 vessels engaged in traffic on the Great Lakes, and areas of ore-bearing property, docks, natural gas and limestone properties, etc. The men who guided the destinies of the new company were J. P.

Morgan, John D. Rockefeller, Elbert H. Gary, H. H. Rogers, Charles M. Schwab, Robert Bacon, Edmund C. Converse, Francis H. Peabody, Percival Roberts, Jr., Charles Steele, William H. Moore, Norman B. Ream, P. A. B. Widener, James H. Reed, Henry C. Frick, William Edenborn, Marshal Field, Daniel G. Reid, John D. Rockefeller, Jr., Albert Clifford, Clement A. Griscom, William E. Dodge, Nathaniel Thayer and Abram S. Hewitt. Charles M. Schwab was chosen president of the corporation and Elbert H. Gary became chairman of the executive committee. Charles M. Schwab resigned the presidency in 1903 and was succeeded by William Ellis Corey. In 1910 the latter was succeeded by James A. Farrell.

In the 20 years since its foundation the United States Steel Corporation has expended over $500,000,000 out of its earnings for the building of new plants and the extension of old ones. Its plants now have a capacity of 20,000,000 tons of steel ingots and all the pig-iron it needs.

It was soon realized that a concern controlling two-thirds of the nation's total possible output must contain enormous potentialities affecting the general welfare of industry and of the country, of its competitors, customers, employees, or through these, the general public. Generally speaking the corporation's selling methods have not been unfair to its competitors and the consumer has fared equally well at its hands. In its treatment of its employees, it is only fair to note that it has spent great sums of money in sanitation and other methods of social betterment. It has opened a way for its employees to become stockholders. On the other hand it has encouraged workers of alien birth, unfamiliar with American customs and ideals, with the object of being unhampered by trades unionism, from which it was supposed the alien worker might be held aloof. During the war years 1914–18, however, these "safe" alien workers became imbued with ultra-radical ideas and the great strike of the autumn of 1919 was the result.

In the first nine months of its operations the United States Steel Corporation reported net profits of $84,779,298, of which $61,420,304 was distributed to stockholders at the rate of 7 per cent on preferred and 4 per cent on the prior issue. In 1902 the net profits were $133,308,764, full dividends were paid and the company showed a surplus balance of $34,253,657. In 1903 began the general industrial depression which lasted well into 1904. In 1905–06 the city of Gary, Ind., was founded by the corporation which erected there a plant of the most modern standard. The corporation's net profits in 1906 amounted to $156,624,273. The year 1907 is one of the most important in the history of the Steel Corporation. During the industrial panic of that year the corporation secured control of the Tennessee Coal and Iron Company, its strongest competitor in the South. The corporation soon found itself in the toils of the law, the government having instituted proceedings for its dissolution as a monopoly in restraint of trade. The taking of testimony was not finished until the spring of 1914 and on 3 June 1915 the United States District Court of Appeals handed down a decision that the corporation was not a monopoly in restraint of trade. Depression in the industrial field caused the corporation to pass dividends in the last quarter of 1913 and again in 1914. Not until March 1915 were operations again under way to 60 per cent of capacity. As the war in Europe developed the business of supplying steel for the *materiel* of war grew apace. By 30 June 1915 one-third of the corporation's output was being exported to England, France and Russia. After the entry of the United States into the war the domestic demand increased far beyond the capacity of the country's steel mills, and under war stress, expansion on an enormous scale ensued.

The total earnings of all properties after deducting all expenses incident to operations, amounted to $208,281,104.23 in 1918. From this must be deducted the charge for interest on outstanding bonds, mortgages and purchase obligations, leaving $136,902,923.36. Dividends for the year were:

Preferred, 7 per cent		$25,219,677
Common	Regular, 5 per cent	25,415,125
	Extra, 9 per cent	45,747,225

In the same year the corporation mined 28,332,939 tons of iron ore; 5,141,365 tons of limestone; 31,748,135 tons of coal; manufactured 17,757,636 tons of coke; produced 15,700,561 tons of pig iron and 240.393 tons of spiegel and ferrosilicon; made 19,583,493 tons of steel ingots and 13,849,483 tons of rolled and other finished steel products; also 7,287,000 barrels of cement. The average number of employees in the service of the corporation during the year and the total wages paid were as follows:

	No. of employees	Total salaries
Employees of subsidiary companies except of railroads under Federal control	251,350	$426,299,290
Employees of railroads under Federal control	17,360	26,364,234
Total	268,710	$452,663,524

The average salary or wage per employee per day of all employees, exclusive of general administrative and selling force, was $5.33 as compared with $4.10 in 1917. The gross earnings in 1918 reached the unprecedented sum of $1,744,312,163. (See STEEL; CORPORATIONS, HISTORY OF; TRUSTS, etc). Consult Berglund, Abraham, 'The United States Steel Corporation' (Vol. XXVII, No. 2, Columbia Univ. Press Publications, New York 1907); Cotter, Arundel, 'The Authentic History of the United States Steel Corporation' (New York 1916), unctiously capitalistic in tone and replete with fulsome adulation of the chief heads of the Steel Trust; United States Steel Corporation—'Statement of Wages' (n.d.); Wilhelm, Donald, 'The Story of Steel' (United States Steel Corporation, Bureau of Safety, Sanitation and Welfare, New York 1917); Annual Reports of the United States Steel Corporation (Hoboken, N. J., annually, 1902—).

UNITED STATES SURVEYS. See SURVEYS, UNITED STATES GOVERNMENTAL.

UNITED STATES OF VENEZUELA. See VENEZUELA.

UNITED SYNOD OF THE PRESBYTERIAN CHURCH. See PRESBYTERIANISM.

UNITED SYRIANS. See SYRIAN CHURCHES.

UNITED WORKMEN, Ancient Order of, a beneficial organization founded in 1868. In 1910 it had 22 grand lodges, 1,970 subordinate lodges and over 110,000 members. In the same year it paid $3,325,000 in benefits.

UNITS OF MEASUREMENT. When any physical quantity is to be measured, it is necessary to select a unit in terms of which the magnitude of the quantity is to be expressed. We may, if we choose, select an entirely arbitrary unit for each different kind of quantity to be measured; or we may select certain arbitrary fundamental units as a basis and construct upon these a consistent system of derived units. The first method is employed (for every-day purposes) in English-speaking countries, and the second in those countries which employ the metric system. In scientific measurements, the second, or "logical" system is also employed, in practically all civilized countries at the present time.

In any system of units of measurement, it is necessary to select at least three units that are entirely arbitrary. It is customary (though not at all essential) to select, as the three fundamental units, the units for measuring length, mass and time. In the English system, the fundamental unit of length is the yard. It is said that the yard was originally defined, by royal decree, as the length of the arm of King Henry I. The United States yard is defined as $\frac{3600}{3937}$ metres; the metre being the fundamental unit of length. The British yard is the distance, at 62°F between two lines on a bronze bar kept at the Standards Office, Westminster, London. The relation of the British yard to the metre, as nearly as it can be determined is

$$1 \text{ yard (British)} = \frac{3600}{3937.0178} \text{ metres.}$$

The foot is then defined as the third part of a yard, and the inch as the 12th part of a foot. In the British system, the unit of mass is the avoirdupois pound, which is defined as the mass of a certain cylinder of platinum in the possession of the British government, which is marked "P. S. 1844"; the letters "P. S." signifying "Parliamentary Standard." In the United States the unit of mass is the pound defined as $\frac{1}{2.20462234}$ kilograms, the kilogram being the fundamental unit of mass. The British pound is a mass of platinum iridium deposited in the Standards Office, London. The United States pound and the British pound are equal as nearly as can be determined. In all civilized countries the fundamental unit of time is the second; the second being defined as the 86,400th part of a mean solar day, or the 86,400th part of the average interval between two successive passages of the sun across the meridian of any given place. In the metric system the fundamental unit of length is the metre; the metre being defined as the distance, at 0° C., between two marks on a certain bar of platin-iridium in the possession of the International Bureau of Weights and Measures, at Sèvres, France. The fundamental unit of mass, in the metric system, is the kilogram, which is defined as the mass of a certain piece of platin-iridium in the possession of the International Bureau of Weights and Measures. The kilogram was intended to be (and is, very nearly), equal to the mass of a cubic decimetre of water, at the temperature (about 4° C.) at which water has its greatest density.

Secondary Units.— The various units that are employed in measurement, in addition to the fundamental units described above, are defined, for the sake of precision, in terms of those fundamental units. The United States gallon is defined as a volume of 231 cubic inches. Measures made to contain this volume are usually standard at either 4° C. or 20° C. (68° F.). That is, they are made to hold a volume of 231 cubic inches at one of these temperatures. State standard gallon measures are of brass and are standard at 4° C. Glass capacity measures are usually standard at 20° C. The British Imperial gallon is defined as the volume of 10 pounds of water at 62° F. when weighed in air at 62° F. with brass weights and with the barometer at 30 inches. The volume of the British gallon is 277.274 cubic inches. Many of the secondary units that are used in English-speaking countries are as arbitrary as the gallon; but others are derived from the fundamental units in a perfectly definite way. The unit of work and of energy, for example, in English and American engineering practice, is the foot-pound; the foot-pound being defined as the work that must be done in order to overcome, through a distance of one foot, a force equal to the attraction that the earth exerts upon a pound of matter. (See FORCE; MECHANICS). The attractive force that the earth exerts upon a pound of matter is often called a "pound." This is incorrect, however, for the pound (like the gram or the kilogram) is a unit of mass, and not of force. The "poundal" is the logical unit of force in the system of units in common use in English-speaking countries; the poundal being defined as the force which, when acting for one second upon a body having a mass of one pound, will communicate to that mass a velocity of one foot per second. The poundal is not in general use, however, because in scientific work, where precision of statement and a high degree of numerical accuracy are of paramount importance, the "centimeter-gram-second" system of units is now almost universally employed.

The Centimeter-Gram-Second System.— The centimeter-gram-second system of units is so called because it is based upon the centimeter as the unit of length, the gram as the unit of mass and the second as the unit of time. The name of the system is commonly abbreviated to "C.G.S." In the C.G.S. system, the unit of force is the "dyne"; a dyne being defined as the force which, when allowed to act for one second upon a body having a mass of one gram, will communicate to that body a velocity of one centimeter per second. The unit of work in the C.G.S. system is the "erg," this being defined as the quantity of work that is done when a force of one dyne is overcome through a distance of one centimeter. The unit of energy is also the erg, because energy is measured by the quantity of work that it can perform. The dyne is a very small unit in comparison with the forces that we commonly have to deal with in the physical world, it being only about 2 per cent greater than the attraction that the earth exerts upon a milligram of matter. To avoid the use of inconveniently large numbers in expressing forces, a unit called the "megadyne" is, therefore,

used to some considerable extent, a "megadyne" being defined as equal to 1,000,000 dynes. This convention of prefixing "mega-" to indicate a unit of 1,000,000 times as great as the unit whose name follows the prefix is quite common. A quantity of work equal to 1,000,000 ergs, for example, is called a "megaerg," or more commonly a "megerg," or a "megalerg." The prefix "kilo-" is similarly used to signify a unit that is 1,000 times as great as the unit to the name of which it is prefixed; this being familiarly illustrated in the "kilogram" and the "kilometer." The prefix "micro-" is also employed to a considerable extent, to signify that the unit to which it relates is one one-millionth as great as the unit to the name of which it is prefixed. A "microfarad," for example, is a unit having a magnitude equal to the millionth part of a farad.

The most arbitrary unit in the C.G.S. system is the "absolute atmosphere," which is defined as the pressure of a megadyne per square centimeter. This unit, however, has the advantage of being perfectly definite. Moreover, it is not greatly different from the ordinary pressure of the atmosphere. At sea-level in the latitude of Paris, for example, a column of mercury 76 centimeters high, and at a temperature of 0° C., exerts a pressure of 1.0136 megadynes per square centimeter; that is, a pressure of 1.0136 "absolute atmospheres."

All of the electrical and magnetic units that are now in common use are based upon the centimeter-gram-second system; and they illustrate, admirably, the convenience of that system.

Electrical and Magnetic Units.—A unit magnetic pole, in the C.G.S. system, is a magnetic pole of such strength that it will repel an equal pole, at a distance of one centimeter, with a force of one dyne. The intensity of a magnetic field, in this system, is numerically equal to the number of dynes of force that the field will exert upon a unit pole that is placed in it. The "moment" of a magnet is the product of the distance between its poles (expressed in centimeters) by the strength of one of these poles; and the intensity of magnetization of a magnet is numerically equal to the moment of the magnet, divided by the volume of the magnet in cubic centimeters.

In electrical measurements, two distinct sets of units are employed, these being known, respectively, as the "electrostatic units" and the "electromagnetic units," because one is commonly employed in calculations concerning static electricity, while the other is employed in work that relates to dynamic (or "current") electricity. Both sets are based upon the C.G.S. system, and it is possible that in the not very distant future a single set of units will be employed for electrical measurements of all kinds. At present, however, this is not feasible, on account of our temporary ignorance with respect to certain points which must be cleared up before the ideal single set of electrical units can be realized. Consult Lodge, 'Modern Views of Electricity'; Maxwell, 'Electricity and Magnetism.'

Electrostatic Units.—The absolute (or C.G.S.) units for the measurement of static electricity are derived as follows: The C.G.S. unit of "quantity of electricity" is that quantity which would repel an equal quantity, situated at a distance of one centimeter, with a force of one dyne. The C.G.S. unit of electromotive force (or difference of potential) is that difference of potential through which a unit quantity of electricity must be raised, in order that the work done shall be one erg. The capacity of a conductor, in C.G.S. measure, is the quotient obtained by dividing the quantity of electricity upon the conductor by the potential which this quantity of electricity produces in the conductor. (The capacity of an isolated sphere is numerically equal to the radius of the sphere, as expressed in centimeters). The unit of current is the current which conveys a unit quantity of electricity in one second of time.

Electromagnetic Units.—The units that are employed in the measurement of dynamic (or current) electricity are derived as follows: The unit of current is the current which, when flowing along a circular arc one centimeter in length and one centimeter in radius, produces, at the centre of the arc, a magnetic field of unit intensity. The unit of "quantity of electricity" is the quantity of electricity that a unit current conveys in one second. The unit of electromotive force (or of difference of potential) is a difference of potential of such magnitude that to cause the flow of a unit quantity of electricity against it requires the expenditure of one erg of work. The unit of resistance is the resistance through which a unit current would be produced, by one unit of electromotive force. The unit of capacity is the capacity of a conductor whose potential is increased by unity, by the addition to the conductor of one unit of electricity. The absolute electrical units, in the electrostatic and electromagnetic systems, have not (in general) received definite names; it being sufficient, in calculations in which these units are employed, to speak of a certain number of "C.G.S. units of electricity," or "C.G.S. units of resistance," etc. For the practical measurement of dynamic electricity in the laboratory and the power-house, the absolute (or C.G.S.) units are not of convenient size; and for them it is, therefore, customary to substitute certain more convenient multiples and submultiples of the electromagnetic units, as they are defined above. The modified units are known as the "ohm," "ampere," "volt," etc., and are considered in the following paragraph.

Practical Electrical Units.—The unit of resistance that is employed almost universally in practical electrical work is the "ohm," which was named for G. S. Ohm, the distinguished physicist and discoverer of Ohm's law. This is defined as equal to 1,000,000,000 (or 10^9) C.G.S. electromagnetic units of resistance; the ideal standard that has precisely this resistance being called, for the sake of distinct identification, the "true ohm." Many physicists have investigated the value of the ohm, as here defined, and have constructed material standards for practical work, having a resistance of one ohm, as nearly as possible. A committee appointed by the British Association for the purpose of investigating the value of the true ohm prepared a coil of German silver wire, which, at a certain definite temperature, was supposed to have a resistance of practically one ohm; and this coil, from the time of its acceptance

by the British Association in 1864 down to the year 1884, was the standard ohm of the world, being known, for definiteness, as the "British Association ohm," or, more briefly, as the "B.A. ohm." It is now customary to define the practical ohm in terms of the resistance of a column of mercury of stated dimensions and temperature, as it is found that the resistance of a solid conductor depends not only upon the material of which the conductor is made, but also upon the physical state of that material with respect to internal stresses and other circumstances. The B.A. ohm of 1864 has a resistance equal to that of a column of pure mercury having a constant cross section of one square millimeter, and a length of 104.83 centimeters; the temperature of the mercury being 0 degrees C. This standard was subsequently found to be materially smaller than the true ohm, and the International Congress of Electricians at Paris, in 1884, adopted, as the equivalent of the ohm, a column of mercury having a constant cross section of one square millimeter, and a length of 106 centimeters; the temperature of the mercury being 0 degrees C., as before. This standard is known as the "legal" or "congress" ohm. Several of the physicists present at that congress were of the opinion that the length of the column should be 106.2 or 106.25 centimeters; but the decimal being admittedly uncertain, it was finally agreed to disregard it entirely, until further experimental evidence could be had. In August 1893 an International Congress of Electricians was held at Chicago; England, France, Germany, Italy, Austria, Switzerland, Sweden, Mexico, Canada and the United States being represented. This congress adopted another and (presumably) better value of the ohm, the new standard being designated as the "International ohm." The International ohm, which has since been adopted by the nations represented at the conference, was defined as "the resistance offered to an unvarying electrical current by a column of mercury (at the temperature of melting ice) 14.4521 grams in mass, of a constant cross-sectional area, and of the length of 106.300 centimeters." The conference preferred, it will be seen, to fix the sectional area by giving the mass of the column, rather than by stating the sectional area directly. The intention was, however, that the sectional area shall be sensibly one millimeter; for a column of mercury 106.3 centimeters long and having a mass of 14.4521 grams, would have a sectional area, at 0 degrees C., of between 1 and 1.00003 square millimeters. The ohm thus defined by the Chicago congress is probably very near to the true ohm.

The practical unit of current is the "ampere," named for the French physicist, A. M. Ampere. It is defined as equal to one-tenth of a C.G.S. electromagnetic unit of current. The Chicago International Congress of 1893, after considering the available experimental evidence, concluded that the ampere can be defined, for practical purposes, as equal in magnitude to the unvarying current which will deposit 0.001118 gram of metallic silver every second from a solution of nitrate of silver in water. This particular estimate of the value of the true ampere is called, for definiteness, the "International ampere." The practical unit of electromotive force is the "volt," which was named for the Italian physicist, Alessandro Volta, and which is defined as equal to 100,000,000 (or 10^8) C.G.S. electromagnetic units of difference of potential or as the electromotive force which is required in order to maintain a current of one ampere through a resistance of one ohm.

Of the remaining practical electrical units, the coulomb, farad, joule, watt and henry call for special mention. The coulomb is the practical unit of electrical quantity. It may be defined either as one-tenth of the C.G.S. electromagnetic unit of "quantity of electricity," or as the quantity of electricity conveyed by an ampere in one second. The farad (named for Faraday) is the practical unit of capacity, and may be defined either as the 1,000,000,000th part of a C.G.S. electromagnetic unit of capacity, or as the capacity of a condenser which holds one coulomb of electricity, when charged to a potential of one volt. The farad is much too large for convenience, and although it is called the "practical" unit of capacity, it is replaced, in practice, by the "microfarad," which is equal to the millionth part of a farad. The condensers which are in ordinary use are commonly made to have capacities of a microfarad, or of some decimal subdivision of a microfarad. The "joule" (named for James Prescott Joule) is the practical unit of work (or energy) in the electrical system of units, a joule being defined as 10,000,000 (or 10^7) ergs; and its practical convenience depends upon the fact that it is equal to the quantity of energy that is expended in one second by a current of one ampere acting through a resistance of one ohm. The "watt" (named for James Watt) is the corresponding unit of power, and is defined either as the expenditure of 10,000,000 ergs per second, or as the rate at which energy is expended when a current of one ampere flows through a resistance of one ohm. In dealing with the large currents that occur in modern electrical power-houses, the watt is an inconveniently small unit, and the kilowatt is almost invariably used in its place; a kilowatt being equal to 1,000 watts. A horse power is equal to 746 watts, or to 0.746 of a kilowatt. The "henry" (named for Joseph Henry) is the practical unit of inductance, and it is defined as the induction in a circuit, when an electromotive force of one volt is induced in this circuit while the inducing current varies at the rate of one ampere per second.

Dimensions.—A surface is said to have extension in two dimensions, and a solid is similarly said to have extension in three dimensions. The volume of a cube, for example, is found by multiplying together the length, width and height of the cube; and hence we may say that the volume in question is of three "dimensions" in terms of L, the unit of length employed. This mode of expression has been extended to other units besides units of length, and the idea has proved itself quite useful in numerous ways. For example, a velocity is found by dividing a length by a time; so that if L represents a length and T a time, we may write $V = LT^{-1}$; and we say that velocity is of dimension $+1$ in length, and -1 in time. Similarly, force is measured by the change of momentum that it produces, in a given mass, per unit of time. That is, it is found by multi-

plying a mass (which we may represent by M) by a velocity, and dividing the product by a time. That is, $F = MV/T$. But we already know that $V = LT^{-1}$, and hence the equation becomes $F = MLT^{-2}$, and we say that force is of dimensions $+1$ in mass and in length, and of -2 in time. The equations here given are called "dimensional equations," since in writing them we pay no attention to the actual numerical magnitudes of the quantities involved, but only to the "dimensions" of those quantities. As a further illustration of the "dimensions" of a physical quantity, let us consider the case of work. This is defined as the product of a force by a distance, and hence we have $W = FL = MLT^{-2}$. $L = ML^2T^{-2}$, and we say that work is of dimensions $+1$ in mass, $+2$ in length and -2 in time. Kinetic energy is found by taking half the product of a mass and the square of a velocity. Omitting the numerical factor ½ (since it does not affect the dimensions of the energy in any way), we have $E = MV^2 = M(LT^{-1})^2 = ML^2T^{-2}$, so that kinetic energy is of dimensions $+1$ in mass, $+2$ in length and -8 in time. That is, it is of the same dimensions in all respects as work; which is evidently correct, since work and kinetic energy are mutually convertible. As an illustration of the determination of the dimensions of a quantity when the result is far less obvious, consider the dimensions of a "quantity of electricity," as expressed in electrostatic units. Let Q denote a charge of electricity, as expressed in electrostatic units. Then if a similar charge were brought near to the first one, the repulsion between the two would be found by dividing the product of the two charges by the square of the distance between them. Hence the dimensions of the repulsion between the two charges would be Q^2L^{-2}. But this repulsion, being a force, must be of the dimensions $F = MLT^{-2}$; and hence we have $Q^2L^{-2} = MLT^{-2}$; whence $Q = M^{\frac{1}{2}}L^{\frac{3}{2}}T^{-1}$ That is, "quantity of electricity," as expressed in the electrostatic system, is of the dimensions ½ in mass, ⅔ in length and -1 in time. For the dimensions of other electrical magnitudes, and for the interesting facts that are known concerning the ratios of the dimensions of the various electrical units, special works on these subjects must be consulted. Maxwell pointed out that in any equation that expresses a fact in nature, the several terms that are added together, or equated to one another, must be all of the same dimensions; a fact of which use has been made above, in determining the dimensions of "quantity of electricity."

As an illustration of the kind of information that can sometimes be had from dimensional equations, in constructing a formula of which we know the general but not the precise form, let us consider the case of the pendulum. Let us suppose that we know that the time of oscillation of a pendulum, through a small arc, varies as some power of the length of the pendulum, multiplied by some power of the intensity of gravity at the place where the experiment is made, and let us seek to find what the unknown exponents are. Representing the intensity of gravity by g, and the unknown exponents by x and y, respectively, the foregoing assumption with respect to the general form of the dependence of the period upon the length of the pendulum and the intensity of gravity gives us an expression of the form g^xL^y, for the time of oscillation of the pendulum. Now g, being an acceleration, is of the dimensions LT^{-2}; so that the foregoing expression is of the dimensions $(LT^{-2})^x L^y$; but this, being the expression for the time of oscillation of the pendulum, must itself be of the dimensions T. Hence we have $(LT^{-2})^xL^y = T$, or $L^{x+y}T^{-2x} = T$. This being an identity, we have, by equating the exponents of T, $-2x = 1$, or $x = -\frac{1}{2}$. And since we also have $x + y = 0$, we see that $y = +\frac{1}{2}$. Hence the time of vibration of the pendulum varies directly as the square root of the length of the pendulum, and inversely as the square root of the intensity of gravity. See METRIC SYSTEM; WEIGHTS AND MEASURES. Consult, also, Everett, 'Units and Physical Constants.'

ALLAN D. RISTEEN.

UNITY OF CONSCIOUSNESS. See CONSCIOUSNESS.

UNITY SYSTEM OF ORGANIZATION. A recent method of systematization of large corporations is that devised by Charles Delano Hines, frequently called the Hines system of organization. It is claimed to be based on the idea that the theory of organization is one of the branches of the science of sociology. The aim and purport of this method is to lay down scientific lines on which to bring about a solution of problems of the complex nature found in large industrial corporations in a manner that is strictly simple and direct. The system is claimed to be applicable to governmental, educational and commercial and industrial functions though its use has been brought, so far, into practice only on several railways. The inventor of the method terms it the "Unit System" because he starts and ends on the basis of a treatment of all social or industrial entities as divided into *units*. The individual is a unit, the association of a number of individuals in a body produces a higher unit and so on into any number of units of division of a corporation however large the aggregation; and however complex the system, it is divided into its constitutent *unit* parts, each part held responsible for the carrying out of its duties and each person retaining his unit value and responsible in turn for his separate individual duties. All with the aim of rendering the complex conditions simple in their units of practice.

Applied to railways the plan abolishes the official titles general superintendent, superintendent of motor power, chief engineer, superintendent of transportation, general storekeeper, etc., at headquarters. The incumbents retain their individual responsibilities but serve under the titles "assistant general managers" of the railway; divisional officials such as master mechanic, division engineer, train-master, etc., assume the titles "assistant superintendents." The number of officials in these capacities are regulated as before by the requirements of the different railways. The former superior official, while losing his individual grade title, to become assistant general manager number one, or assistant superintendent number one, etc. With the absence from headquarters of a senior officer (number one, etc.) his superior officer

places the next best adapted for the position on the post to manage as superior at headquarters. This changing of positions with the underlying change of responsibilities in the system is used at times to give the officers and staff a rotation of offices. And by this method it is endeavored to fit the units into the general working of the whole so as to permit interchangeability of the parts or units without friction or reduction of efficiency of the machine. It is claimed to give to all a wider activity and enlarged practical knowledge of the workings of the organization in its complex entirety. The purpose is to break down the lines of demarcation, red tape, etc., frequent in railway (and other organization) management, making the offices more liquid, while initiating the individuals into a better purview of the organization. The individuality is maintained of the units by their retaining each his responsibility for the fulfilment of his special duties, his personal activity being made clear to all by his individual signature appearing on all papers instead of the usual initals; this rule is carried out through all the ranks from chief to operator and clerk.

UNIVERSAL LANGUAGE, a general term applied in modern times to any one of those artificial languages designed for facilitating intercourse between peoples whose national languages differ one from the other. The need of a universal language has been keenly felt from the earliest times. In the early days of commerce Phœnician was in general use along the Mediterranean littoral; in the Classic Ages of Rome and down to the close of the Middle Ages Latin was the common means of intercommunication in the Occident. Contact with the East at the time of the Crusades gave rise to the so-called *lingua franca.* Since the Renaissance and with the rapid extension of modern commerce and trade to all quarters of the world the need of a universal tongue has been demanding the attention of educators, financiers, diplomats and others to a greater degree than ever before. The 19th century saw several universal language systems proposed, most of which were speedily forgotten.

Those who have examined the problem are aware that the selection of a living tongue as the universal language would at once arouse international jealousies. In this regard it may be noted that, despite its clumsy spelling, English is coming into such general use throughout the world that the question of a universal language may be settled automatically. The universal language systems, Esperanto (q.v.), etc., are based on European spoken tongues and are, it is alleged, unsuited to universal use in that they ignore the root elements of the linguistic groups of the other continents. However, it would be manifestly impossible to build a system including elements of all groups and the artificial systems have at least the merit that they may be acquired with less effort than the simplest of modern spoken tongues.

UNIVERSALISM. Universalism is a belief in the final triumph of good over evil in the universe. As applied to the human economy, it is a belief that God is pledged by His goodness and omnipotence to put an end to sin and ultimately to save the whole family of mankind. Or, as is more commonly stated in later years, Universalism is the doctrine that the destiny of mankind is progress onward and upward forever; that always before man is a chance to develop and that always in man is a power to unfold, always a time and a place in which to grow and always in man a power to respond to the opportunity. Universalists claim that they find this teaching in early Christianity, that it is the essential doctrine of Jesus and Paul and that it was advocated by notable writers of the Early Church, the most notable advocate being Origen. From the time of the Protestant Reformation to the close of the 18th century there appear many eminent theologians who either directly or by implication taught the doctrine. Special emphasis is laid by some writers on the fact that of the six great schools of Christian theology in the early centuries, four very positively taught the final salvation of all souls, one taught annihilation of the wicked and only one taught endless misery.

The organization of a church and denomination with the name Universalist had its beginning in the United States and its first advocate was the Rev. John Murray, who came to this country from England and landed on the coast of New Jersey at a place now called Good Luck, in September 1770. The story of Mr. Murray's arrival and work in America has much of romance about it, or perhaps of Providence. The substance of those early years may well be recorded here.

Mr. Murray was brought up as a strict Calvinist and from early years was connected with the Methodists, having been made a class leader by John Wesley. Later he united with Whitfield's Tabernacle in London. He was a devout student of the Scriptures and during this period rather peculiar circumstances made him acquainted with the Rev. James Relly, who was preaching Universalism in London. A young Methodist woman had become a convert to Mr. Relly. Mr. Murray was given the task of reclaiming her to Methodism. In the conversation the young woman got the better of the argument and Mr. Murray was led to investigate for himself the views of Mr. Relly, with the result that finally he became a thorough convert to Universalism. In the midst of this religious investigation, Mr. Murray's wife, to whom he had been married but a short time, died. Disturbed by religious problems and broken-hearted by his sorrow, Mr. Murray sailed for America, against the advice of his friends, in order that he might lose himself in the New World. As the ship in which he was sailing approached New York, it was driven by a storm over a sandbar into Barnegat Bay. The ship was too heavily laden to cross the bar at the mouth of the bay and proceed on its journey, so a part of the cargo was put on board another vessel and Mr. Murray was sent on shore to obtain food to provision the small sloop. In the search for food he met a man named Thomas Potter, who had built a church nearby his house, in which he hoped to hear some time the gospel of the final salvation of all men, the doctrine which he believed. As Murray interviewed Potter, some voice told Potter, so he says, that here was the man who would preach the gospel which Potter had longed to hear and this proved to be the fact. It was, however, only after long persuasion and after repeatedly saying that he had come to America

to escape from himself and religious work, that Murray consented to preach the next Sunday. When the service was over Potter exclaimed: "At last has come the man and the gospel for which I have been longing." This was the beginning of John Murray's work in America as a Universalist minister. He preached many times at Good Luck, then in New York and at length in New England and finally he established what is known as "The Independent Christian Church" at Gloucester, Mass. This was the first organized Universalist church in America. Gradually, however, other preachers, from Virginia to Maine, began to preach the doctrine that God would save all men and before the end of the century there was at least one congregation in nearly all of the leading cities of the Atlantic Coast. By his travels Mr. Murray made friends for himself and his cause, and, among others, he had close association with prominent Revolutionary leaders and served the cause of the Revolution as the chaplain of the Rhode Island brigade. The early advocates of Universalism came out from the existing denominations and brought with them something of the peculiarities which marked the churches from which they came. John Murray was evangelical in all points save that of the final salvation of mankind. His argument was that the sacrifice of Jesus paid the debt of sin for all mankind and that in the death of Jesus all men would be saved. Sharp controversies arose very soon between men who had come from other denominations and gradually there followed new arguments for the salvation of mankind; and of all the men who led the early church controversies the Rev. Hosea Ballou stands out with especial prominence. Other prominent early Universalist preachers were Elhanan Winchester, George Richards, Walter Ferris, Sylvanus Cobb, De Benneville, Noah Parker, B. Streeter and Caleb Rich. They were all vigorous and individualistic thinkers, some agreed with one another only on the doctrine that somehow, somewhere, sometime, all souls would be saved.

In 1785 the first real organization of churches under the name Universalist was effected in the town of Oxford, Mass. In 1790 a more extended gathering of Universalists met in Philadelphia. At this meeting were representatives from churches in Massachusetts, New Jersey, Pennsylvania and Virginia. This convention adopted articles of faith and a form of church government. The articles were five in number and related (1) to the Holy Scriptures, (2) to the Supreme Being, (3) to the Mediatorship of Christ, (4) to the work of the Holy Ghost, (5) to the necessity of good works. In 1803 there was held in Winchester, N. H., a convention of Universalists which produced a confession of faith that was made, later on, the basis of fellowship and faith in the Universalist denomination. This profession of faith, like the others which had preceded it, was not adopted as an obligatory statement of faith, but only as the common ground on which those gathered could unite for the organization of a convention. The articles then adopted are as follows:

"Article 1. We believe that the Holy Scriptures of the Old and New Testaments contain a revelation of the character of God, and of the duty, interest and final destination of mankind.

Article 2. We believe that there is one God, whose nature is Love, revealed in one Lord Jesus Christ, by one Holy Spirit of Grace, who will finally restore the whole family of mankind to holiness and happiness.

Article 3. We believe that holiness and true happiness are inseparably connected, and that believers ought to be careful to maintain order and practise good works, for these things are good and profitable unto men."

A prominent figure at this Winchester convention was the Rev. Hosea Ballou, already referred to, who was then 32 years of age. He advocated a doctrine of Universalism quite different in many points from that of John Murray. His fundamental doctrine was the universal fatherhood and infinite love of God and he argued that the death of Christ came as the effect of this eternal principle. Also he argued that sin is a voluntary transgression of the law and not an inherited condition, that the human will is free and yet that ultimately man will conform to the will of God; that the death of Christ was not to pay a debt to God, but to draw men away from sin; that Christ was example and inspiration to lead men to the perfect life; that man would suffer reasonable punishment for violation of all law, but in the end would work in harmony with God. This doctrine of Hosea Ballou has sometimes been called the doctrine of salvation by character. From the appearance of Hosea Ballou a large number of Universalists turned away from John Murray toward Mr. Ballou. It was at this time also that there arose a group who called themselves Restorationists. Their particular view was that through the sacrifice of Jesus all men would be restored to a state of original innocence. Others said man would receive all punishment in this life, but the larger number affirmed that man would enter the next life with the character he had on leaving this and that the cleansing and purifying process would continue there as here, until man would conform to the laws of God and that no punishment would be everlasting.

In 1870 the centennial of Universalism was observed by a great gathering in Gloucester, Mass. This brought together noted Universalists from all over the country; among the leaders were Dr. T. J. Sawyer, Dr. A. A. Miner, Dr. E. H. Chapin, Dr. R. H. Ryder, Dr. I. M. Atwood, Dr. S. H. McCollester, Dr. E. C. Sweetzer, Horace Greeley, Dr. J. S. Cantwell, Dr. C. H. Leonard, Dr. John S. Lee, Pres. E. H. Capen, Dr. A. Gunnison, Dr. Henry Blanchard, Dr. J. C. Adams.

In preparation for the celebration the Murray Centenary Fund of $100,000 was raised and a permanent organization of the Universalist General Convention was effected. In fact, the unified work of the Universalist Church really dates from this time and has tended steadily toward a more co-operative system of operation. In the first years following 1870, the general secretary, Dr. G. L. Demarest, was the chief executive officer of the body. There were chosen 11 men from different sections of the denomination for a board of trustees and through committees from this board the work of the Church was carried on. There were committees on foreign missions, on education, on increase of the ministry and on finance. But as the churches multiplied and the work became more varied, other officers were added, a special departure being the addition of a general superintendent

of churches, which has finally resulted in a system of State superintendents. At this meeting in 1870 the Winchester Profession of Faith was adopted as the basis of fellowship and all who entered the ministry were required to subscribe to this statement. Almost immediately, however, discussions arose and decided objections grew up to certain phrases and words. This controversy continued, often resulting in much hostile debate, until 1899, when there was substituted for the original creed what was known as a statement of the principles of faith, as follows:

"I. The acceptance of the essential principles of the Universalist Faith, to wit: (1) The Universal Fatherhood of God; (2) The Spiritual Authority and leadership of His Son, Jesus Christ; (3) The trustworthiness of the Bible as containing a revelation from God; (4) The certainty of just retribution for sin; (5) The final harmony of all souls with God.

The Winchester Profession is commended as containing these principles, but neither this nor any other precise form of words is required as a condition of fellowship, provided always that the principles above stated be professed.

II. The acknowledgment of the authority of the General Convention and assent to its law."

This statement gave new freedom and individual congregations made their own statements of belief. The Church as a whole followed the philosophy of Hosea Ballou rather than that of John Murray, and replaced the trinitarism of Murray with the unitarianism of Ballou. The two denominations, Unitarian and Universalist, were offshoots from the Congregational Church of New England, the Universalists emphasizing the final salvation of all, and the Unitarians the humanity of Jesus and the dignity of human nature. Gradually the thinkers of the two denominations have come to essentially the same position on the fundamentals of faith Also the liberal orthodox church has gradually come to the same position, so that at the present time there exist cordial relations between the Universalists, Unitarians and Congregationalists.

The Universalist General Convention is the controlling organization, having jurisdiction over the churches in the United States and Canada. It holds biennial sessions on the Wednesday preceding the fourth Sunday in October.

The Convention is composed of: first, of its officers; second, of the president, vice-president and secretary of the several State conventions in its fellowship; third, of the general superintendent and the several State superintendents; fourth, of all ordained clergymen in fellowship either with such a State convention or with the General convention and, unless disabled by years or sickness, actively engaged in the work of the ministry; fifth, delegates from each parish in fellowship, each such parish being entitled to one lay delegate.

To be entitled to such lay delegates and in order that its minister be eligible to be a delegate, every parish must maintain its legal existence and support public worship regularly and make a contribution on quota to the General Convention during each of the two years prior to the meeting of said convention. All the laws relating to the fellowship, ordination and discipline originate in the General Convention, and it is the final court of appeal in all questions in dispute or in differences between the State conventions. The convention is a body incorporated under the laws of the State of New York to hold real and personal estate. In the interim of its sessions, the interests of the Church are managed by a board of 11 trustees, who meet three times a year, and at the biennial session. The Church has funds aggregating $600,000. There are now about 45 State conventions also with funds, with about 900 parishes, with a church membership of 53,000; 750 Sunday-schools with a membership of 50,000; 803 edifices, total valuation, $12,000,000, and 602 clergymen in fellowship.

These figures regarding the membership of the Universalist Church are misleading and a truer statement would be that the Universalist Church has 250,000 adherents.

As part of the Church are other organizations, more or less independent in their activities, but at the same time recognizing the general authority of the General Convention. One of these organizations is the Women's National Missionary Association, composed of women working for home and foreign missions. It has several divisions of activity and supports missions in many fields, particularly in the South and in Japan. It holds large funds of its own, the income going for missionary propaganda. It has flourishing auxiliary organizations, for the study of missions and the promotion of missionary undertakings.

Another important organization is the Young People's Christian Union, a body composed of the young people. Its special work has been to develop local unions for the purpose of training young people in religious life. It has directed the starting of new churches and supported missionaries in the South and West. It publishes a weekly paper, known as the *Onward*. It holds annual sessions and gives much attention to the distribution of denominational literature.

Under the direction of the board of trustees there have been formed several commissions to look after the interests of the denomination. Of importance is the commission on social service which carries on the study of social problems of the day and distributes a large amount of literature in the interests of church social service. There is the commission on the ministry whose work is to increase the number of students in theological schools. Also the commission on temperance which, through a superintendent, carries on a temperance campaign and distributes a large quantity of literature.

Associated with the General Convention is the Universalist Historical Society, whose object is the gathering up and the preservation of books, pictures and all facts relating to the history of the Universalist Church and its men.

Connected with the General Convention also is the John Murray Association in Gloucester, Mass., which maintains the house in which John Murray lived, now filled with relics relating to the life and work of John Murray

Very early in its history the Universalist Church became the patron of higher education, believing it necessary to provide for an educated ministry. The more important of these schools are Tufts College, Massachusetts, the University of Saint Lawrence, Canton, N. Y., Lombard College, Galesburg, Ill., three academies: Dean at Franklin, Mass., Goddard Seminary in Barre, Vt., and Westbrook Seminary in Maine. These schools and colleges possess buildings and equipment aggregating over $6,000,000.

The theological schools maintained are (1) the Canton Theological School, opened at Canton, Saint Lawrence County, N. Y., in 1858. Although affiliated with Saint Lawrence University, the theological school is a separate institution in its management and property. (2) Crane Theological School, affiliated with Tufts College, Medford, Mass. This was established in 1868 as Tufts Theological School but was changed to the name of Crane Theological School in 1898, in honor of an endowment from Albert Crane of Stamford, Conn. (3) In 1881 a theological department was opened in Lombard College, Galesburg, Ill., and in 1890 its name was changed to the Ryder Divinity School, in honor of the late Rev. William Henry Ryder, D.D. In 1910 the school was removed to Chicago, where it became a part of the University of Chicago, though still retaining its name.

The denomination has a publishing house and a book headquarters at 359 Boylston street, Boston. Here also are the official offices of the General Convention. Other offices are located in Utica, N. Y., and Western headquarters at Saint Paul's-on-the-Midway, in Chicago.

The publishing house puts forth *The Universalist Leader, The Sunday School Helper, The Myrtle, The Onward* and the *Universalist Register.* It owns copyrights to 150 volumes and has net assets of over $200,000. In the South, at Atlanta, is published the *Universalist Herald.*

In 1919 a great drive for a million dollars was started, to be finished in 1920 when Universalists will hold a series of meetings at Gloucester, Mass., in celebration of the one hundred and fiftieth anniversary of the landing of John Murray. Great enthusiasm has been stirred by this denomination-wide drive and a large increase in church members and parish funds has resulted in addition to the General Denominational Fund.

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UNIVERSALS, logical entities which may be exemplified by instances. Universals comprise attributes, which may be embodied in a situation into which but one individual thing enters, and relations, which require for their exemplification a situation wherein at least two distinct things are found. Ever since Plato regarded his universals as real existing archetypes of the corresponding particulars, the attribute-universals have assumed an undue preponderance over the relation-universals. The real Ideas of Plato made way for the less autonomous forms of Aristotle, which turn the potentiality of matter into actuality. However, these were not clearly defined as to the precise measure of their autonomy. This uncertainty of the Aristotelian philosophy engendered the cardinal problem of the earlier epoch in scholasticism: Are universals but a mere name used to limit a group of particular things, or are they real entities existing prior to and apart from their exemplifications? The former of these positions in known as nominalism; the latter, which was that of Plato, as realism. Realism adopted as its motto «Universalia ante rem»; nominalism, «Universalia post rem.» The synthesis of this dilemma is due to Abelard whose position is summarized as «Universalia in re» — the universals in the thing. The universals, that is, are far more than mere names, but their mode of being is not that of a higher world of things — as is that of the Platonic Ideas— but just precisely the mode of being which consists in subsuming particular situations. Nominalism and realism did not cease to exist as separate views after Abelard had thus synthetized them into what is known as conceptualism. In the great epistemological dichotomy of the Enlightenment, the British empiricists manifested a strong nominalistic tendency, while the rationalism of the continent was more inclind toward realism, though their attention was less directed toward the problem of universals than that of their colleagues across the Channel. Thus Hume denied the existence of general ideas, and held that every universal is carried by some particular idea which functions as a symbol for all its fellows. Descartes and Spinoza, on the other hand, assigned to matter and soul a position logically and epistemologically antecedent to that of particular things, and certainly soul and body are universals in the sense that they respectively subsume all mental and material phenomena.

At the present time the extreme nominalistic and realistic views both find their most vigorous discussion in psychology. Realism dominates the older faculty-psychology, which regards thought and feeling and will as active forces, instead of mere aggregates of cognitive and emotional and voluntary phenomena. Opposing this is that nominalism which traces its ancestry back to Hume through associationism. The nominalism of experimental psychology finds in the mind but a mere aggregate — not a system — of mental states, and the various mental faculties are simply names for various sub-aggregates of these states, so that the task of the observer is done when he has given an exhaustive inventory of his atomic experience. While he may grudgingly admit one or two fundamental psychical attributes, he is particularly unwilling to attribute to the mind anything like a relational organization. The psychologist's reluctance to recognize order, system and structure in the mind is due to the fact that orders and systems and structures are universals of the relational type, and that the experimental psychologist has no very clear idea of the existence of universals anywhere.

The opinion of the present day, on the part of those who have brought themselves to logical self-consciousness, is strongly in favor of some sort of conceptualism. A universal is plainly more than a name. This is shown by such a statement as. «John and Jane are twins.» «Twins» is a universal; of what is it the

name? It is clearly not the name of John and Jane separately, for it is not enough that John should be a twin — the twin of Mary — and that Jane should be a twin, the twin of Paul. The thing that is twins is the couple consisting of John and Jane. Now, a couple is clearly a universal, subsuming its two members as particular instances. According to the nominalistic theory, then, it is simply the name, "John and Jane." But this name is not twins — the only way in which it could conceivably be called twins is in reference to the twins themselves. As this reference is again a universal, and, therefore, but a name to the nominalist, it is clear that we become involved in an infinite regress, at no stage of which has the original statement a meaning. The only alternative is that the twin-couple of John and Jane is something more than a name embracing the two persons in question. This is not by any means, however, to attribute to the couple an existence on the same level of being as that of its terms — otherwise we fall into the difficulty incurred by the ancient Chinese philosopher who said that a bay horse and a dun cow were three — the horse, the cow and the two of them together. Bertrand Russell has shown many inextricable contradictions into which such an opinion must inevitably lead us. A universal, then, is a pefectly genuine, real thing, but its mode of genuineness and reality is precisely that of being embodied in concrete instances. See CONCEPTUALISM; NOMINALISM; REALISM.

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UNIVERSE. In the article STARS will be found a description in detail of those wonderful bodies which stud the sky. In the present article we consider these bodies as forming a connected whole, which we call the universe, and which comprehends creation in its widest extent. Many questions connected with the universe are not yet answered; but our ideas of its structure are surely though slowly advancing. The object of the present article is to set forth what can be said on the subject at the present time.

The first question to rise is the oldest. Is the collection of heavenly bodies — stars and nebulæ — which we see with our telescopes, a bounded whole of any kind; or do such bodies extend through infinite space, so that those we see are distinguished from the others only by their proximity to our system? The general trend of modern science is toward the former alternative. While it is quite true that no limit can be set to the possible extent of creation, the evidence is very strong that that portion of creation which can be studied by man forms a bounded whole, having certain common characteristics which run through its whole extent. It seems almost certain that there is a limit in every direction beyond which the stars become comparatively few and scattered, if they exist at all. Indeed, if we consider the recent testimony of the delicate photographic plate, there seems no escape from this conclusion. As is well known, the chemical action upon such a plate of the rays of light from the stars is cumulative, so that the longer the exposure to a selected region of the sky the larger will the images of the brighter stars become and the more distinct the images of the faint ones. Excessively faint stars may, in fact, not appear upon the plate at all until the exposure has been greatly prolonged, and multitudes of such objects can in fact be photographed in this way which are far too faint to be seen in any existing telescope. A photograph taken by Roberts of a region in Cygnus which was particularly rich in stars was duplicated by him two years later, but with an exposure four times as long. A careful examination of the two plates showed that no additional stars had been revealed upon the second one. The same result has since been obtained in several different portions of the sky, an exposure of 10 or 12 hours showing in some cases but very few more images than an exposure of one or two hours. It must be remembered that in our universe stars of all varying degrees of size and brightness are doubtless inextricably intermingled, and that a single fainter star is not necessarily more distant than a single brighter one, though the fainter stars are as a whole unquestionably farther away. Nevertheless it seems certain that, at least in the regions above referred to, there have been secured upon the plates records of all objects large enough to exist as self-luminous suns. And if the universe is thus limited in several different directions, we must conclude that it is as a whole not of infinite extent. Another simple consideration which is often adduced as a proof of this fact is that if the stars extended outward without limit, their infinite number would fill the whole sky with a blaze of light equal to that of the noonday sun. Instead of this we have a night-sky so faint that a circle of it half a degree in diameter is almost or quite invisible to the eye. But this proof is only conclusive if we suppose the space between the stars to be absolutely free from dark matter, so that light is not perceptibly absorbed during its passage to us. That this condition is not perfectly met is certain from many considerations, but that the amount of this dark material, whether it principally consists of meteoric material, cosmic dust or atoms or ions of repelled gasses, produces but little effect upon light transmitted from a finite distance is evident from a study of the behavior of light of different wave lengths which comes to us from distant stars. (See LIGHT VELOCITY). But the effect, small or even undetectable though it may be, prevents our drawing any certain conclusions in regard to a universe of perfectly unlimited extent. Another idea of the subject may be based on the principle that in a universe of stars, extending out indefinitely, there would be nearly four times as many stars of each order of magnitude as of the order next brighter. This is true in the case of the stars visible to the naked eye. But, when counts are made of the telescopic stars, it is found that although the number of each successive order increases, the ratio of increase continually diminishes, thus showing that a limit must finally be reached.

Another indication bearing on the same question is afforded by the Milky Way. This vast girdle, which consists of agglomerations of stars, has a unity of structure throughout its whole extent which justifies us in considering it as, in a certain sense, a single object, and it is not improbable that this represents the densest portion of our own limited universe of suns.

Another conception of the universe is gained by considering the thickness with which the stars are scattered through space; in other words, how many stars a given volume of the celestial spaces, in the general average, may contain. Measures of parallax, and studies of proper motion, lead to the conclusion that the thickness of the stars, as thus defined, is a fairly definite quantity. To measure the volume of space we require a unit. The most convenient unit for our purpose is the volume of a sphere whose centre is in the solar system, and whose surface is at a distance represented by a parallax of half a second. This distance is, in round numbers, 400,000 times that of the sun from the earth, a space through which light would travel in about seven years. The volumes of spheres being as the cubes of their radii, it follows that a sphere whose surface is at twice the distance of the unit sphere, or 400,000 times the distance of the sun, will have a volume represented by the number 8, while 100 times the radius will have a volume of 1,000,000 units. Now, the indications are that the stars are strewn through space with such thickness that, in the general average, each unit of space contains one or two of these bodies. The law according to which the stars thin out, and investigations into the statistics of the stars generally, lead to the conclusion that the parallax of the most distant of these bodies is about 0″001. This distance is 500 times that which we have chosen as the radius of our unit sphere; the volume of space included within it is, by the law of cubes, 125,000,000 and, were the stars scattered with equal thickness throughout the whole space, the number contained would be between 125,000,000 and 250,000,000.

Although, in the general average, it is probable that the thickness of the stars in space does not vary greatly within the limits we have indicated, there are exceptions in special cases. The most notable exception is that of the Milky Way, where the stars are undoubtedly much more thickly strewed in space than they are in the central regions of the system. We also find in many regions of space collections of hundreds or even thousands of stars evidently in close proximity to each other. But outside of these collections the scattering is probably nearly uniform as far out as the limit we have mentioned.

Altogether, we may say with some confidence, that if we could fly through space to a distance over which light would require 10,000 years to travel, we should find ourselves approaching the boundary of the stellar system, if we were not actually outside of it. But all that has been said refers only to our own visible universe, that is, to the Milky Way cluster, or cloud, of stars of which our own sun is one. It is as impossible for us to conceive of a totally empty space extending without limit in all directions from our universe as it is for our minds to grasp the conception of other, far distant, universes which perhaps more or less resemble our own, and which succeed one another throughout a space which is also absolutely endless. If such other universes exist, it can only be said that as yet we have no known means of discovering them.

Notwithstanding the darkness of the sky, it seems probable that we receive more light from it than could be supplied by all the stars, seen and unseen, which make up the known part of the universe. This conclusion is based on the fact that the amount of light received from a circle one degree in diameter on the darkest night-sky is about equal to that of a star of the 5th magnitude, while, when we carry out the progression in the light of the stars of diminishing orders of magnitude, we find that the total of their light could not well amount to so great a quantity as this. The source of this excess of light is yet to be investigated. Whether it is atmospheric, whether it is reflected from innumerable opaque bodies, or whether it is emitted by a nebulous mass of almost inconceivable tenuity, has not yet been determined.

A remarkable feature of our relation to the universe is that our solar system seems to be very near its centre. That we are near the central plane of the Milky Way is shown by the fact that the latter is nearly a great circle on the celestial sphere. It is true that the most exact determination yet made shows a slight displacement of our system, since the central line of the Milky Way is about one degree from that of the great circle which would pass nearest to it. Another basis for the same conclusion is that the stars seem about equally numerous in the direction of the two opposite poles of the Milky Way. If there is any deviation from equality, it seems likely that the faint telescopic stars are fewer in number toward the south pole than toward the north pole of the Milky Way. This view is not yet proved, and cannot be until we have more exact counts of the stars of each order of magnitude in the two hemispheres. The question whether our system is situated with equal exactness in the centre of the great girdle does not admit of settlement. All we can say is, that, up to the present time, there is no positive evidence on which to base a statement that we are any nearer one point of the girdle than another. It is indeed true that, in the constellations Aquila and Sagittarius, which are visible in the south on autumn evenings, the Milky Way shows numerous rifts and vacant spaces which are not shown on its opposite side. This might seem to indicate that we are nearer to it in this region. But further researches are required before a definite conclusion can be reached.

It should be remarked that, even if we are at present centrally situated, the position cannot be permanently held. The motion of the solar system through space, by which we are carried forward on a journey of which we can see neither the beginning nor the end, at the rate of 10 or 12 miles a second, must eventually carry our posterity away from the centre of the universe, even if we are now situated near that point. But this motion will have to be continued hundreds of thousands, even millions, of years before the displacement would be appreciable when compared with the dimensions of the universe.

SIMON NEWCOMB.
Revised by ERIC DOOLITTLE.

UNIVERSITY. Introductory.— It is difficult to define the American university. In a certain sense it may be said not to exist. When we speak of the English universities, the Ger-

man universities or the University of Paris, we have in mind educational institutions of distinctive if not of actually unique type whose organization and procedure are crystallized and whose aims and ambitions are clear-cut and capable of definition. The mere term university is misleading in America because in actual practice there is no consistent distinction between the terms college and university. Many institutions which are hardly reputable secondary schools parade under the name of college, and many institutions which are barely able to do work of collegiate grade are burdened with the title of university. Both the terms lose distinctiveness through illegitimate use.

On the other hand the confusion is worse confounded, in the minds of the lay public at least, by the seemingly indiscriminate use of the terms by thoroughly reputable institutions. The layman who has long been lead to believe that the leading American university is located at Cambridge, Mass., is puzzled when he discovers that the legal titles of the controlling bodies of this great institution are "The President and Fellows, and the Board of Overseers, of Harvard College." As a matter of fact there is both a Harvard College and a Harvard University. The title Harvard College, the original name of the institution, is now applicable to the organization and administration of the group of courses in the liberal arts leading to the degree of bachelor of arts, and the title Harvard University is applicable to the several departments of the institution as a whole, including Harvard College. In a somewhat similar way Columbia College persists as a part of the greater Columbia University. There is also still a Yale College within Yale University.

Then, to turn to the other extreme, we discover that such reputable institutions as Colgate University, James Milliken University, De Pauw University and a long list of others which might be named, which make no pretense outside of their titles of being what they are not, are not in any respect universities in the sense in which the term university is broadly used to cover the entire groups of educational activities centred in Harvard, Yale and Columbia. In other words, the name or title alone of a higher educational institution signifies nothing in this country. We must know the history and the objects of any college or university before we can determine its character or its place in our educational world.

While titles are used so indiscriminately that the terms college and university have no concise meaning to the public mind, there yet remains a distinction, very clear in the minds of educators and becoming evident in practice here and there, which gains ground as time goes on. The truth is that we do have institutions which merit inclusion under the general term of the American university even though we yet find it difficult to give a concise definition to that general term. The American university is coming to have an identity of its own even if its title is not always trustworthy. The Regents of the University of the State of New York, which, incidentally it should be said, is not a university at all but simply the corporate title of a State Department of Education, have defined a college as follows:

"An institution to be ranked as a college must have at least six professors giving their entire time to college or university work, a course of four full years of college grade in liberal arts and sciences, and should require for admission not less than the usual four years of academic or high school preparation or its equivalent, in addition to the pre-academic or grammar school studies."

This definition has been adopted by the Carnegie Foundation for the advancement of teaching and under the frequent use of this agency is operating widely to give identity to the college. The definition serves well enough at the bottom but leaves us yet without a definition of a university. The Education Law of the State of New York adds to the confusion by declaring, in defining its own terms, that "the term 'college' includes universities and other institutions for higher education authorized to confer degrees." No one has done better than Ezra Cornell in fixing the limits of the American university in a few words. His often-quoted declaration, "I would found an institution where any person can find instruction in any study," affords a real distinction between a college as defined above and a real university such as he actually founded at Ithaca, N. Y. Cornell University will be found in any comprehensive list of higher educational institutions whether the list be headed colleges or universities.

Without concern about confused and confusing nomenclature, the distinction which educators make between a college and a university is this: a college is a higher educational institution offering mainly courses of instruction leading to the bachelor's degree; a university is a college or group of colleges or departments under one control offering courses of instruction leading not only to the bachelor's degree but also to the master's and the doctor's degrees. There is yet another distinction, more academic than real, which would classify as colleges those institutions devoted entirely to work leading to the bachelor's degree and as universities those institutions devoted to scientific research and to the general widening of human knowledge and admitting only graduate students. The general tendency seems to be to regard as the typical American university the institution embracing the union of college and university offering both undergraduate and graduate courses. The reputable American university approaches this definition in practice no matter what its title is. This definition covers the actual activities of many of the leading State universities and embraces the ideals of all of them.

State universities help markedly to give character and worth to the American university as a recognized educational institution, and all that can be said with regard to the present status of the endowed universities applies with equal force to the State universities.

The number of endowed American universities which have risen to places of assured prominence in the educational world is not large. The origin and development of 10 leading institutions in the order of their foundation illustrate the problems common to the whole group and the reader is referred to the special articles under the respective titles: HARVARD UNIVERSITY; YALE UNIVERSITY; UNIVERSITY OF PENNSYLVANIA; PRINCETON UNIVER-

SITY; BROWN UNIVERSITY; COLUMBIA UNIVERSITY; CORNELL UNIVERSITY; JOHNS HOPKINS UNIVERSITY; LELAND STANFORD JUNIOR UNIVERSITY; UNIVERSITY OF CHICAGO.

Entrance Requirements.— The completion of a standard four-year high-school course is now the announced fundamental basis of admission to the typical American university. Indeed, practically all institutions which lay claim to the title of college or university make the announcement that the four-year high-school course is the minimum basis of admission. The character of any institution which claims college rank is readily determined by the deliberate honesty with which it administers its announced entrance requirements. Of course there is great divergence in the determination of what constitutes a standard high school, both as to its announced course of study and as to the faithfulness and thoroughness with which the course is presented. The subjects required for admission vary considerably in different universities and differ materially for admission to different courses. Entrance is calculated upon the basis of "units," 14 to 16 units being the usual requirement. A unit approximately represents the successful pursuit of a high school subject each school day for a school year. Thus, credit in elementary algebra, or in plane geometry, each of which is usually pursued for a full year in high school, entitles the student to one unit for college entrance. The units are usually specified as required and elective; from 10 to 12 units being required and from three to five units being elective.

The gradual evolution of the entrance requirements may be understood from an examination of the Harvard entrance requirements. The present terms of admission at Harvard may be said to have been over 276 years in the making. It was in 1642, though Harvard College was founded six years earlier, that the college statutes provided:

"When any Schollar is able to read Tully or such like Classical Latin Author Extempore, and make and speake true Latin in verse and prose, without assistance, and decline perfectly the paradigms of nounes and verbes in ye Greeke tongue, then may hee bee admitted into ye college, nor shall any claime admission before such qualifications."

This specified reading knowledge of Latin and Greek was the essential entrance requirement in all the colonial colleges, and the Harvard entrance requirements remained with very slight changes, as quoted, for nearly a century. Arithmetic was required about the first of the 19th century and geography in 1807, algebra in 1820, history in 1847, physical geography in 1870, French and German in 1875.

The change in entrance requirements which is actually taking place at the present time may be understood by reference to the "old" and the "new" plans of admission announced in the latest Harvard catalog. To be admitted to the freshman class of Harvard College under the old plan a candidate must present himself for examination in certain studies. These studies must amount to 16½ units of school work, except that candidates who present both elementary Latin and elementary Greek will be admitted without conditions on 15½ units of school work. In not less than five units a candidate must pass examinations with grades that are "satisfactory" as distinguished from grades that are "merely passable." The prescribed studies include English and a foreign language for the degree of A.B., and a modern language, history, mathematics and science for the S.B. degree. Sufficient additional subjects must be chosen from a long list of electives to make up the total specified number of units.

Under the new plan, to be admitted to Harvard College one must present evidence of his secondary school work, showing (a) the subjects studied by him and the ground covered; (b) the amount of time devoted to each; (c) the quality of his work in each subject. To be approved this statement must show (a) that the candidate's secondary school course has extended over four years; (b) that his course has been concerned chiefly with languages, science, mathematics and history, no one of which studies has been omitted; (c) that two of the studies of his school program have been pursued beyond their elementary stages. A candidate whose secondary school course is found to be satisfactory may then present himself for "comprehensive" examinations in four subjects, as follows: (a) English. (b) Latin, *or*, for candidates for the degree of S.B., French or German, or Spanish. (c) Mathematics, or physics, or chemistry. (d) Any subject (not already selected under (b) or (c)) from the following list: Greek, French, German, Spanish, history, mathematics, physics, chemistry.

The Course of Study.— The conventional course of study in the American university for the undergraduate has from the very beginning until recent times covered four college years. It has frequently been urged that "there is nothing magical or imperative in the term of years," and educators have widely discussed the desirability of shortening the college course, especially for the student who takes up professional study after he secures his baccalaureate degree. It is now possible to secure this degree in many institutions in less than four years and to secure both the baccalaureate and the professional degrees in seven years; but the traditional four-year course yet prevails in the main and seems not likely to give way rapidly for the great majority of students.

It is frequently urged also that the term of four years has no natural relation to a course of study. The subjects offered in the undergraduate course show bolder departures from the earlier types. The English model was followed in our universities almost exclusively until the Revolution. The degree of bachelor of arts, based upon classical and philosophical studies, prevailed. Yale followed the example of Harvard, and Princeton followed the example of her predecessors. It was not until 1846 that the Lawrence Scientific School was established and provision made for a course leading to the degree of bachelor of science. College catalogs present a great variety of courses of study and many degrees of prescription, but are commonly reducible to three types, as follows: (1) Those in which all the work for the degree is prescribed; (2) those which prescribe part and leave the rest to the choice of the student; (3) those which contain prescribed

courses, require concentration in one or more departments and leave a certain proportion open for the free election of the student.

Graduate Work.— The graduate school of fering advanced courses of study leading to the master's and the doctor's degrees is of comparatively recent growth in this country. Harvard enrolled students as "resident graduates" before 1800 and Yale established a "department of philosophy and the arts" for scientific and graduate study in 1847, but it was not until 1860 that Yale made the first announcement in the United States concerning the awarding of the degree of doctor of philosophy. Harvard followed in 1872 with the announcement that it would confer the degrees of doctor of philosophy and doctor of science.

According to the report of the United States Commissioner of Education 31,826 baccalaureate degrees were conferred in 1915–16 by universities, colleges and technological schools in the United States, 20,586 upon men and 11,240 upon women. In the same year 4,524 graduate degrees were conferred, 3,462 upon men and 1,062 upon women. There were also 825 honorary degrees conferred. The degree of doctor of philosophy included in the above was conferred on examination by 42 institutions on 520 men and 81 women. No reputable institution which is not adequately prepared to do so undertakes to award this degree upon examination. It is, therefore, a reasonably safe index to the institutions, which regardless of title are prepared to do university work. The degree of doctor of philosophy was granted on examination in 1916 as follows: University of California, 22; University of Denver, 2; Yale University, 50; Catholic University of America, 3; George Washington University, 6; University of Chicago, 79; Northwestern University, 3; University of Illinois, 33; Indiana University, 4; Iowa State College, 1; State University of Iowa, 8; University of Kansas, 1; Johns Hopkins University, 37; Massachusetts Agricultural College, 3; Boston University, 5; Massachusetts Institute of Technology, 3; Harvard University, 52; Clark University, 13; Radcliffe College, 4; University of Michigan, 22; University of Minnesota, 7; University of Missouri, 5; University of Nebraska, 1; Princeton University, 27; Rutgers College, 1; Cornell University, 34; Columbia University, 88; New York University, 8; Syracuse University, 3; University of North Carolina, 2; Ohio State University, 3; University of Cincinnati, 2; Bryn Mawr College, 3; Grove City College, 3; University of Pennsylvania, 12; University of Pittsburgh, 1; Brown University, 6; University of Texas, 3; University of Vermont and State Agricultural College, 1; University of Virginia, 2; University of Washington, 1; University of Wisconsin, 37.

The requirements for the degrees of doctor of philosophy and master of arts are reasonably uniform in reputable institutions throughout the country. The following statement from the Yale *Catalogue* for 1916–17 gives the typical requirements for these degrees. "The degree of doctor of philosophy is conferred upon students of either sex who hold the bachelor's degree from a college of high standing, and have satisfactorily completed not less than three years of graduate study and met the other prescribed conditions for the degree. Students who have received their bachelor's degree from colleges not of sufficiently high standing must expect to spend more than three years in graduate study; the length of time to be determined in each case by the character of their previous work and the quality of the work done here. With the approval of the faculty, work of equal grade done in residence at other universities will be accepted for the degree, but not less than one year of graduate work must be done in this university. Ordinarily the final year of residence should not be devoted wholly to the completion of the dissertation, but the candidate, unless especially excused by the department in which his major work is done, should continue some plan of study involving attendance on at least one course. It must be understood, however, that the degree is not given as a certificate of residence and work, however faithful; it is granted only to such students as give evidence of general proficiency, power of investigation and high attainments in the special field in which the major work is done. The evidence of such attainments must be given by dissertation and by examinations. Evidence of sufficient attainments in German and French at least two years before the degree is given must be presented to the dean. The dissertation should show that the candidate has technical mastery of the field in which he presents himself, is capable of doing independent scientific work, and is able to formulate such conclusions as may in some respects modify or enlarge what was previously known. . . . A general oral or written examination, as the department may determine, irrespective of examinations upon single courses, shall be held upon the whole major subject offered by the candidate and upon such subordinate subjects as may be required by the department."

"The degree of master of arts is conferred upon men who hold the bachelor's degree from a college of high standing and have satisfactarily completed not less than two years of resident graduate study and met the other prescribed conditions for the degree. Work done *in absentia* will not be accepted. Students who have received their degree from colleges not of sufficiently high standing must expect to spend more than two years in graduate study, the length of time to be determined in each case by the character of their previous work and the quality of the work done here. Residence at another university may be accepted for the first of these years, provided the evidence of work submitted is satisfactory to the committee on the degree. A reading knowledge of one language other than English is required before the student will be accepted as a candidate for the degree, and any department of study may make a specific requirement of a reading knowledge of French or German or both."

Statistical Data.— The following statistics from the report of the United States Commissioner of Education for the year 1915–16 give evidence of the scope of the work of higher educational institutions in the United States: Number of institutions, 574; number of students enrolled in collegiate and resident graduate departments, 259,511, of whom 164,075 were men and 95,436 women; number of instructors,

34,869, of whom 28,472 were men and 6,397 women; total receipts, $133,627,211; productive funds, $425,245,270; benefactions during the year, $30,196,006; number of fellowships, 17,774; number of volumes in libraries, 20,234,734; value of library, scientific apparatus, machinery and furniture, $80,554,609; value of grounds, $87,607,540; value of buildings, including dormitories $307,159,298.

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UNIVERSITY, National. See NATIONAL UNIVERSITY.

UNIVERSITY OF ALABAMA, the highest educational establishment of the State of Alabama, and a part of the public school system maintained by the State. The university is administered through the following organizations: The College of Arts and Sciences; School of Education; College of Engineering; School of Law; School of Medicine (at Mobile), and Summer School for Teachers, with a staff of, in the neighborhood of 100 teachers and professors. Some 14 buildings are grouped around a campus of 40 acres, in a tract of nearly 300 acres, adjacent to the city of Tuscaloosa. In addition to the regular university library, the institution contains a document room with some 15,000 documents and pamphlets, including the publications of the Federal government; a law library, engineering library, museum library, and several department libraries. It also possesses the largest Museum of Natural History in the South. The students' interests and activities are represented by two publications, *The Crimson-White,* a weekly journal, and *The Corolla,* an annual. The university confers the master's degree in arts and sciences; the bachelor's degree in arts, education, science, science of education, civil engineering, electrical engineering, mining engineering, chemical engineering and civil and highway engineering; in law (LL.B.) and in medicine also gives the degree of M.D.

The University of Alabama was created by an act of the Federal legislature of the United States in 1820, and to it were turned over several sections of government lands; but it was not until two years later that the trustees of the projected institution met in Tuscaloosa. The work of construction of the buildings progressed slowly and it was not until 1831 that the university was opened to students. The university buildings were burned during the Civil War by United States cavalry (1865); but in 1869 they were partially replaced and the work of the institution resumed. In 1884 the Federal Congress granted to the university an additional 46,080 acres of land, in payment for the buildings lost during the war. In 1907 the State legislature of Alabama voted $400,000 to increase its equipment and sanctioned the federation of the Medical College of Alabama, at Mobile, with the State university.

UNIVERSITY OF CALIFORNIA. See CALIFORNIA, UNIVERSITY OF.

UNIVERSITY OF CINCINNATI. See CINCINNATI, UNIVERSITY OF.

UNIVERSITY CLUB, The, an organization of New York, incorporated in 1865. Members are required to hold a university or college degree representing a course of not less than three years of study; or an honorary degree, in the case of distinguished personages. Graduates of the United States military and naval academies are also eligible. The limit of membership is 3,500,—2,000 resident and 1,500 non-resident and of the army or navy.

UNIVERSITY COLLEGE, the specific title of an institution attached to various British universities. (1) University College, Oxford, the oldest in the university, founded through the munificence of a bequest of William, archdeacon of Durham, shortly after 1249, consists of a master, nine ordinary Fellows, one civil law Fellow, 15 scholars and 14 exhibitioners. The fellowships are held seven years, but may be extended under certain conditions. The scholarships ($400 per annum) are open to all who have not exceeded 19 years of age. There are seven church livings in the gift of this college. The earliest statutes of the college date from 1280. (2) University College, London, founded 1828, is closely connected with London University. (3) The name is also given especially to three of the four colleges which form a Welsh University, namely, the University College of Wales at Aberystwith, University College of South Wales at Cardiff, and the University College of North Wales at Bangor. The students of these colleges, proceeding to degrees, have to go through a course at either London, Dublin, Edinburgh or Glasgow. (4) University College, Dundee, Scotland, founded in 1882, is affiliated with Saint Andrews University. (5) There are other colleges bearing the title in Exeter, Nottingham, Reading, Southampton, etc.

UNIVERSITY COSTUME. See COSTUME ACADEMIC.

UNIVERSITY COURSES. See SUPPLEMENTAL EDUCATION.

UNIVERSITY EXTENSION. See SUPPLEMENTAL EDUCATION.

UNIVERSITY OF NORTH CAROLINA. See NORTH CAROLINA, UNIVERSITY OF.

UNIVERSITY OF THE PACIFIC (now College of the Pacific), located at San José, Cal. It was founded at Santa Clara in 1851 under the auspices and control of the Methodist Episcopal Church; in 1871 it was moved to San José; about 40 years after its incorporation Napa College was consolidated with it, and the name of the University of the Pacific adopted. Later the name was changed to College of the Pacific. It is open to both men and women. The organization of the university includes the College of Liberal Arts, the Academy, the School of Elocution and Oratory, the School of Commerce, the School of Art and the Conservatory of Music. The College of Liberal Arts offers regular four-year courses, for completion of which the degree of A.B. is conferred. The work of the last two years in each course is elective, a limited amount of work in certain departments being required according to the major chosen. The School of Commerce offers a college course in commerce, together with training for expert secretaries and accountants. The School of Elocution offers a course covering three years; the Art Department, a course of three years. The full course in the Conservatory of Music

extends over four years, and leads to the degree of bachelor of music. The college is situated in the Santa Clara valley, within easy reach of both San José and Santa Clara; and occupies six large buildings. The library in 1917 contained 10,000 volumes; the income amounted to $79,000; the students numbered 465, and the faculty 35.

UNIVERSITY OF PENNSYLVANIA. See PENNSYLVANIA, UNIVERSITY OF; and consult Lippincott, H. M., 'The University of Pennsylvania: Franklin College' (1919).

UNIVERSITY PLACE, Neb., thriving city in Lancaster County, on the Chicago, Rock Island and Pacific Railroad, about four miles northwest of Lincoln. It has a Carnegie library and is the seat of the Nebraska Wesleyan University and of the State Agricultural College. Pop. about 5,000.

UNIVERSITY OF ROCHESTER, Rochester, N. Y., was established by Baptists of the State of New York in co-operation with citizens of Rochester, and was opened for students in 1850. Since 1900 women have been received as students, a co-ordinate college having been established for them under the same faculty as the college for men. A bequest for this purpose made by Lewis H. Morgan many years previously became available for this use in 1909. The university conducts curricula leading to the degrees A.B. and B.S., also to the degree B.S., in mechanical engineering and in chemical engineering. There is a campus of over 27 acres in the centre of the residence section of the city, in addition to an athletic field of 12 acres for physical education. On the campus there are 11 buildings, including a beautiful Memorial Art Gallery. The library contains 75,000 volumes; thoroughly equipped laboratories and museums provided for instruction in biology, chemistry, geology, mechanical engineering, physics and psychology; the faculty numbers 49; the students in a recent year numbered 535, of whom 271 were women.

UNIVERSITY SETTLEMENTS. See SOCIAL AND UNIVERSITY SETTLEMENTS.

UNIVERSITY OF THE SOUTH, located at Sewanee, Tenn. It was chartered in 1857 by the southern dioceses of the Protestant Episcopal Church; the site and endowment were obtained, and the central building begun, when the Civil War stopped further operations and rendered the endowment worthless. In 1867 more funds were obtained largely through the efforts of Bishop Quintard of Tennessee, and the Grammar School — Sewanee Military Academy since 1908 — (secondary grade) and Academic Department — College of Arts and Sciences — opened to students in 1868. The university now includes the Sewanee Military Academy, the College of Arts and Sciences, the Theological Department organized in 1878, and a Training School for Nurses connected with the Hodgson-Emerald Hospital. The Medical Department established in 1892, the Law Department established in 1893, and the School of Pharmacy established in 1904, were discontinued in 1909. The College of Arts and Sciences offers studies leading to the degree of B.A., and a course in civil engineering. The degree of M.A. is conferred for graduate work. In the Theological Department the degree of B.D. is conferred on all who complete the regular three-years' course (including Greek and Hebrew) who have held a Bachelor's degree for at least one year from some approved college or university and have presented a satisfactory thesis on a subject approved by the faculty. The course in the Training School for Nurses is three years in length. Seven scholarships are available for students in the Theological Department, and about 25 for students in the College of Arts and Sciences. A unit of the Students' Army Training Corps was established in the college in 1918. Full provision is made for physical training, and there is a general interest in athletic sports which are under the direction of the Athletic Board of Control. Seven Greek letter fraternities are represented at the university, and the students also maintain two literary societies, writing, debating and musical clubs, a dramatic club, and The Sewanee Union, a social club for students, officers, members of the faculties, alumni and residents of the town of Sewanee. The university owns a domain of 8,000 acres in the midst of the beautiful scenery of the Cumberland Plateau; a reservation of 1,000 acres surrounds the central buildings, from which building lots are leased for long terms. The chief buildings are Saint Luke's Memorial Hall (Theological Department), Saint Luke's Memorial Chapel, Walsh Memorial Hall, the library with a tower modeled upon that of Magdalen College Chapel, Oxford, in which are a clock and peal of bells, Thompson Hall, Hodgson-Emerald Hospital, Hoffman Memorial Hall (dormitory), Quintard Memorial Hall (Sewanee Military Academy), All Saints Chapel, the Carnegie Science Hall and the gymnasium (partly completed). The library in 1918 contained 38,000 volumes; the students in all departments numbered 405, and the faculty 35.

UNIVERSITY OF SOUTH CAROLINA, the State college located at Columbia, S. C., chartered in 1801, and first opened in 1805. In July 1863 the college was closed on account of the Civil War, many students having enlisted in the Confederate army, and the buildings were used as a hospital by the Confederate government. The charter was amended in 1865, departments of medicine and law added, and the name changed to the University of South Carolina; the unsettled political condition of the State led to the closing of the institution a second time in 1877. The next year the charter was again altered, and the university divided into two branches, South Carolina College at Columbia and Claflin College at Orangeburg (the latter for colored students); the branch at Columbia was opened in 1880 as the South Carolina College of Agriculture and Mechanic Arts. In 1882 several new departments were added and "of Agriculture and Mechanic Arts" dropped from the name; the Law School was added in 1884. In 1887 the charter was changed for the third time, the name of University of South Carolina again adopted, and a College of Pharmacy, Graduate Department and Normal School added. In 1890 there was a fourth reorganization, the agricultural, mechanical, medical and normal courses were discontinued, and the name changed to South Carolina College. In 1894 normal courses were added to the curriculum. The college now offers the following

courses: (1) Four courses: classical, Latin-science, Latin-literature, and modern literature, leading to the degree of A.B.; (2) two courses: mathematical, physical and chemical-biological, leading to the degree of B.S., also special courses in civil and mechanical engineering by the addition of certain studies to the mathematical physical course leading to the degree C.E.; (3) three normal courses, one of four years, leading to the degree of A.B., one of three years and a special course of two years; (4) a two-year course in the Law School, leading to the degree of LL.B., and (5) a graduate course for the degree of A.M. The work of the last two years of the A.B. and B.S. courses is partially elective. The special normal course is strictly professional and includes practice work. There are also normal courses for teachers given in the spring. There are 12 scholarships, besides State scholarships for each county for normal students. The library in 1916 contained about 50,000 volumes; the students numbered 578 and the faculty 38. In 1906 the institution was reorganized under the title University of South Carolina. The schools as then established were Arts, Science, Teachers' Graduate, Law.

UNIVERSITY OF SOUTHERN CALIFORNIA, located at Los Angeles. It was established in 1879 and first opened to students the following year. The institution is under the auspices of the Methodist Episcopal Church. Men and women are admitted on equal terms. The organization includes nine colleges, i.e., Liberal Arts, Physicians and Surgeons, Law, Dentistry, Theology, Pharmacy, Oratory, Fine Arts and Music; a School of Education; a University High School. In the College of Liberal Arts there are offered undergraduate courses in 21 major subjects, all of which lead to the A.B. degree. There are also offered four-year courses in electrical and civil engineering, leading to the degree of B.S. The degrees of A.M. and M.S. are offered in the graduate department. The courses in the other colleges lead to the usual degrees in professional subjects. Under authority from the State Board of Education the university is empowered to grant the High School Teachers Recommendation upon the completion of the required graduate work in the School of Education. The university campus comprises about 15 acres well located in the south central part of the city and accessible by ample car service. The colleges of Physicians and Surgeons, Dentistry, Law, Music and Fine Arts at present occupy buildings in other parts of the city. A recently completed endowment campaign for one million dollars has placed the available resources at nearly two millions. New buildings are projected which will be erected as soon as war conditions will permit. The library contains 35,000 volumes, the City Public Library and the County Law Library are also available for student use. In 1917–18 the faculty numbered 378 while the enrolment of the student body was 4,096.

UNIVERSITY OF THE STATE OF NEW YORK, The. At the close of the American Revolution there existed in New York city an institution known, previous to that time, as King's College, which during the Revolution had become thoroughly disorganized. Its property had been largely dissipated, its course of instruction had been suspended and many vacancies existed in its governing board. Moreover its name, King's College, had become distasteful to the colonists, who had now cast off all allegiance to kings. To meet and remedy these conditions, the legislature of the State of New York, at its very first session after the close of the Revolution, on 1 May 1784, passed an act entitled, "An act for granting certain privileges to the college heretofore called King's College for altering the name and charter thereof and erecting an university in this State." By this act the corporate rights of King's College (the name of which was now changed to Columbia College) were vested in the regents of the University of the State of New York. The regents were also "empowered to establish from time to time such additional colleges as they might think proper, such colleges to be a part of the State University."

In 1787 Columbia College was made a self-perpetuating and separate governing body (see COLUMBIA UNIVERSITY), and the same year the act of 1784 was replaced by a new act which specifically enacts that "An University be and is hereby instituted in this State to be known and called by the name or style of the REGENTS OF THE UNIVERSITY OF THE STATE OF NEW YORK." This act authorizes the regents to visit and inspect all the colleges, academies and schools which are or may be established in this State, to examine into the state of education and discipline, and to make a yearly report thereof to the legislature. It also gives to the regents the power to confer degrees and to grant charters of incorporation to colleges and academies.

The organization thus perfected has, with a few changes, continued to the present time. In 1894, the University of the State of New York was made a constitutional body, to be governed by a board of not less than nine regents, and their corporate powers may be modified, increased or diminished by legislative enactment.

In 1904 the jurisdiction of the regents was extended to cover the elementary schools, which previously had been under the direction of the superintendent of public instruction. The present objects of the university as expressed in the Education Law of 1918 are:

> "To encourage and promote education, to visit and inspect its several institutions and departments, to distribute to or expend or administer for them such property and funds as the state may appropriate therefor or as the university may own or hold in trust or otherwise, and to perform such other duties as may be entrusted to it."

Regents.—The university is governed and all its corporate powers are exercised by a board of regents, serving without salary, whose members are at all times three more than the existing judicial districts of the State—at present nine districts and 12 regents. The officers of the board of regents are the chancellor and vice-chancellor, who serve without salary. Subject and in conformity to the constitution and laws of the State, the regents exercise legislative functions concerning the educational system of the State, determine its educational policies, establish rules for carrying into effect the laws and policies of the State relating to education and the powers, duties

and trusts conferred or charged upon the university. The regents elect by ballot the president of the university and the commissioner of education who holds office during the pleasure of the board. The university is the State Education Department; charged with and under its caption, and in its name as such, it exercises the general management and supervision of all public schools and all the educational work of the State.

Degrees.— The regents under their seal confer certificates, diplomas and degrees on persons who satisfactorily meet the requirements prescribed.

Examinations.— In the secondary institutions of the university regents examinations furnish the standard of graduation and of admission to colleges. Certificates or diplomas are conferred by the regents on pupils who satisfactorily pass the academic examinations. The regents also supervise the entrance requirements to the professional schools and conduct the professional licensing examinations.

Registration.— The regents register both domestic and foreign institutions in terms of New York standards, fix the value of degrees, diplomas and certificates issued by institutions of other States and countries and presented for entrance to schools, colleges and the professions in New York State.

Incorporation.— Under such name and with such number of trustees or other managers, and with such powers, privileges and duties, and subject to such limitations and restrictions in all respects as the regents may prescribe in conformity to law, the regents by an instrument under their seal and recorded in their office incorporate universities, colleges, academies, libraries, museums and other institutions or associations for the promotion of science, literature, art, history or other departments of knowledge or of education in any way, associations of teachers, students, graduates of educational institutions and other associations whose approved purposes are in whole or in part of educational or cultural value deemed worthy of recognition and encouragement by the university. No institution or association which might be incorporated by the regents may be incorporated under any other general law without their consent.

Extension.— The regents extend to the people at large increased educational opportunities and facilities, stimulate interest therein, recommend methods, designate suitable teachers and lectures, conduct examinations and grant credentials and otherwise organize, aid and conduct such work.

Visitation.—The regents or their representatives visit, examine into and inspect institutions in the university and require annual reports, duly verified, from the various institutions of the university.

Departments and Divisions.— The regents establish such departments and divisions as they deem useful in the discharge of their duties. The educational and administrative work is performed by five departments of the university: higher education, secondary education, elementary education, State library and science. The work of these departments is distributed among 11 divisions, namely, administration, agricultural and industrial education, archives and history, attendance, educational extension, examinations and inspections, law, library school, school buildings and grounds, school libraries, statistics and visual instruction.

Education Building.— It is occupied exclusively by the university, including the various departments and divisions of the work, together with such other work as the regents may in their discretion provide for therein. The building and the officers of the department are maintained at State expense, and are located at Albany, N. Y., the State capital. See NEW YORK, UNIVERSITY OF THE STATE OF (vol. 20, p. 238).

Convocation.— The University Convocation is held annually in the Education Building on such dates as the chancellor and commissioner determine. Its object is to ascertain and formulate educational opinion; to make recommendations and by the co-operation of educational forces to advance educational interests. Its membership includes all educational officers, teachers and others interested in the educational well-being of the State.

Publications.— The university publications include handbooks, bulletins and reports. The purpose of the handbook is to afford accurate up-to-date information in reply to correspondents; of the bulletins, authoritative information at stated intervals to specialists; of the reports, permanent educational information to the public. Handbook 6, parts 1 and 2, and a list of Museum publications afford information regarding the university's publications.

Examiners.— Under professional laws, boards of examiners in medicine (including chiropody), dentistry, veterinary medicine, pharmacy, nursing, accountancy, optometry, shorthand reporting and architecture are connected with the university; under regents' rules the State Examinations Board; under the Court of Appeals, the Board of Law Examiners; under the Education Law, the Teachers Retirement Fund Board.

Advisory Councils.— Under regents' rules advisory councils are appointed representing the various institutions — convocation, college, academic, library, medical, dental, veterinary, pharmacy, nurse training, music, industrial and trades, history, publications, agricultural education, industrial education.

Supervision.— In addition to the teachers affording instruction to the students in attendance on the various institutions of the university there is a body of supervisors giving their attention to the administration of the schools, namely, principals of elementary schools and of secondary schools; deans, presidents and chancellors of higher institutions; superintendents of district, village and city schools and inspectors of the university.

Appropriations.— The State makes annual appropriations for educational purposes to the elementary schools, to the secondary schools, to the higher institutions, to the State Library, to the State Museum and to the divisions of the university. Additional appropriations are made by local authorities to school districts and to municipal districts and to higher institutions through endowments, benefactions and fees.

Institutions.— The institutions of the university include all elementary, secondary and higher educational institutions which are now

or may hereafter be incorporated in this State and such other libraries, museums, institutions, schools, organizations and agencies for education as may be admitted to or incorporated by the university.

Education Department.— The university is the education department whose president is the commissioner of education — the chief executive officer. It is his duty also to devote himself to educational research; to the study of the educational work of the systems of other jurisdictions; to introduce and originate, so far as possible, better methods of education.

The Assistant Commissioner and Director of Professional Education.— He has charge of higher education including matters relating to universities, colleges, professional and technical schools and to the execution of educational laws concerning the professions. His field of labor is the department of higher education.

The Assistant Commissioner for Secondary Education.— He has charge of secondary education including matters relating to academies, academic departments, academic schools, high schools, the training of teachers therefor, and to the State College for Teachers. His field of labor is the department of secondary education.

The Assistant Commissioner for Elementary Education.— He has charge of elementary education including matters relating to elementary schools, the training of teachers therefor; and of the division of school libraries. His field of labor is the department of elementary education.

The Director of the State Library.—He has charge of the State Library and of the State Library School. His field of labor is a department of the university.

The Director of the Department of Science.— He has charge of the department of science and the State Museum. His field of labor is a department of the university including the work of the State Geologist and Paleontologist, Botanist, Entomologist, Mineralogist, Zoologist, Archeologist and the custody of the State Museum.

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UNIVERSITY OF WOOSTER. See WOOSTER, COLLEGE OF.

UNKAR. Piute Indian name given by Walcott to a thick group of limestone, red shale and quartzite with basalt flows of Algonkian age in Grand Cañyon of Arizona. These beds have a thickness of 6,830 feet, are tilted and faulted considerably, and lie on gneiss of supposed Archean Age.

UNLEAVENED BREAD, bread made without leaven or ferment and prescribed in the Jewish law (Ex. xii, 15, 17) to be used at the Passover festival; it is required in the Latin Church as one of the two eucharistic elements. The Authorized Version of Ex. xii, has «And ye shall observe *the feast of unleavened bread*,» and from this it has been inferred that this feast is not identical with the Passover; but the words in italics are confessedly interpolated by the translators, and they appear to be the only ground for the inference: the Septuagint version has no such interpolation, but neither has it the term (*azyma*) for unleavened bread; it renders the passage, «And ye shall observe this command.» In the Eucharist, the Oriental churches, as the Greek Orthodox, the Nestorian, and the rest, including the Oriental churches in communion with Rome, except the Maronites and the United Armenians, use leavened bread for the Eucharist: in churches of Latin rite unleavened bread alone is permitted. The Council of Florence (1439), in the Decree of Union, defined that consecration either in leavened or unleavened bread is valid. The usage of the Protestant churches conforms with that of the Oriental Church.

UNTERMEYER, Louis, American writer: b. New York, 1 Oct. 1885. He was educated at the Dewitt Clinton High School and entered commercial life but found writing more to his liking and became associate editor of *The Masses* and a contributor to the *Chicago Evening Post*, the *New York Times*, the *Yale Review*, etc. He is particularly happy in his parodies and is the author of several attractive volumes, notably 'Translations from the poem of Heinrich Heine' (1917).

UNTERMEYER, Samuel, American lawyer: b. Lynchburg, Va., 3 March 1858. He took his degree from Columbia University, New York, to which city the family moved soon after the war, and he was admitted to the bar in 1879. He rose rapidly in his profession, became famous as a corporation attorney and was noted for his connection with celebrated cases. Lately he has been special adviser to the government in the interpretation and enforcement of the income tax law and was active in securing the enforcement of anti-trust legislation. He is a leader of the Jewish race and a man whose council is sought on all important undertakings.

UNTERWALDEN, oon'tĕr-vär'dĕn, Switzerland, one of the smaller cantons, in the centre of Switzerland, bounded on the north by Lucerne and the famous lake of Lucerne, on the east by the Urner Alps which separate it from Uri, and on the south and west by Bern. The pasturage of cattle is the chief support of the inhabitants, and there is a considerable trade in agricultural produce and in wood. The surface is mountainous; the most remarkable summits are those of Pilatus and of Titlis. The canton is divided into two valleys, Upper and Lower (Obwalden and Nidwalden), by a forest called Kernwald, which crosses it from north to south. Each of these valleys forms an independent state, but is represented by only one member in the council of the Swiss states, instead of two, as all the whole cantons are. The chief town of Obwalden is Sarnen, and of Nidwalden, Stanz. Area of Obwalden, 183 square miles; pop. about 17,000; area of Nidwalden, 112 square miles; pop. about 14,000.

UNTHANK, James Bryant, American college president: b. Williamsburg, Ind., 1849. He was graduated from Earlham College, Richmond, Ind., in 1874, was professor of history and logic, 1874–81, and was president of Wilmington College, Ohio, for a quarter century.

UNWIN, William Cawthorn, English civil engineer: b. Coggeshall, Essex, 12 Dec. 1838. He was educated at the City of London School, and was instructor at the Royal School of

Naval Architecture and Marine Engineering, Kensington, 1868–72. Since 1885 he has been professor of engineering at the Central Technical College of the Guilds of London, Kensington. He has published 'Wrought Iron Bridges and Roofs' (1869); 'Machine Design' (1877); 'The Testing of Materials of Construction' (1888); 'The Life of Hirn' (1896); 'Treatise on Hydraulics' (1907), etc.

UNYORO, oo-nyō'rō, British East Africa, a former native state of about 30,000 square miles, bordering on the Albert Nyanza, and now included in Uganda. Pop. estimated at 1,500,000.

UP FROM SLAVERY, an autobiography by Booker T. Washington (q.v.), published in 1901. Its author was a slave until freed by the Emancipation Proclamation. The story of his career is told with much grace and simplicity as well as extreme modesty.

UPANISHADS, oo-pă-nī-shădz', a series of mystic treatises belonging to the Vedic literature. They are primarily about 30 in number and contain the mystical doctrine of the Hindus regarding the human soul, the nature of deity, and the process of creation. Various apocryphal writings have been discovered and added, until the latest list totals about 250. They constitute part of the Brahmanas or commentaries belonging to the Veda and present the Vedic doctrine in a comprehensive form. They describe the Supreme Being, and union with the All, and many of them deal with sectarian Post-Vedic identifications of the Supreme Being with Brama, Vishnu and Siva. Though not supposed by Hindus to have been revealed in the same manner as the Vedic hymns, the Upanishads are not assigned to human authorship, but are deemed inspired writings. These writings breathe the spirit of all the Eastern religions, especially Buddhism. They teach that the highest part of the individual, the atman, descends through sheaths for experiences on the earth plane. Some of them are closely connected with Yogi philosophy, and all are based on belief in reincarnation. Many of these books are also classed as Vedic literature. They appear to have been written at various periods within about 1,000 years before the Christian era. For a further understanding of the subject read the works of Max Müller, Annie Besant, Gough's 'Philosophy of the Upanishads' (London 1903); Jacob, 'Concordance to the Principal Upanishads and Bhagavadgita' (1891); and Oldenberg's 'Die Lehre der Upanishaden' (Göttingen 1915). See BRAHMANAS; KARMA; METEMPSYCHOSIS; SANSKRIT; VEDA). There is an English translation of the principal Upanishads by Max Müller, 2 vols.

UPAS TREE, a Javanese tree (*Antiaris toxicaria*), celebrated for its poisonous qualities, which, however, have been very much exaggerated. It was long believed in Europe that this tree was a solitary one situated in a valley in Java, that the pestilential qualities of it were so great that neither herb nor animal could live within many miles of it, and that criminals alone were sent to gather poison from it, few of whom ever returned. The Javanese themselves dread this tree, and will not rest beneath it, or even pass to leeward of it. The upas tree belongs to the *Urticaceæ*, and the stem rises for about 60 feet before the first branch puts out. The wood itself is harmless, being used for furniture, but the bark, which is whitish, and nearly an inch thick, when wounded, exudes a viscid, milky yellowish sap, which becomes brown upon exposure and hardening into gum. From this sap, when mixed with the seeds of capsicum and other substances, a deadly arrow-poison is made, which is at first purgative and emetic in its efforts, and then narcotic, finally killing the victim by tetanic convulsions. It is called upas-antiar. When the tree is felled or the bark is much injured, the tree gives out noxious exhalations which will cause cutaneous eruptions, and if the upas tree be burned the smoke from it will produce the same result. A variety is the sack tree. It has a bark, pieces of which, when soaked and beaten, can be turned inside out without tearing, and, a section of the wood having been left for a bottom, can be used as a sack. It is said that a kind of coarse cloth is made from the fibrous inner bark of the upas tree, and is worn by poor people, but that if wetted it excites an intolerable itching of the wearer's skin.

UPCHURCH, John Jorden, American mechanic: b. Franklin County, N. C., 26 March 1822; d. Steelville, Mo., 18 Jan. 1887. He gained a wide knowledge of mechanics and engineering through practical experience, engaged in constructing large saw and flour mills, was master mechanic on the Main Hill and Schuylkill Haven Railroad in 1841–54 and in 1868 entered the machine shops of the Great Western Railroad at Meadville, Pa. On 27 Oct. 1868 he founded there the first lodge, consisting of 14 members, of the Ancient Order of United Workmen, a fraternal organization which has since extended into every State and Territory of the United States. He removed to Missouri in 1873, where he was engaged as master mechanic of the carshops of the Saint Louis, Salem and Little Rock Railroad and also superintendent of the building of the shops and the purchase and erection of machinery.

UPCOTT, William, English autograph collector: b. London, 1779; d. Islington, 1845. He became assistant to Richard Porson as librarian of the London Institute (1806) but resigned (1834) to become a collector of autographs and gathered an immense number. He published an 'Account of the principal works relating to English topography' (3 vols., 1818); edited 'Evelyn's Miscellany' (1825) and engaged in other literary work up to the day of his death.

UPDEGRAFF, Milton, American astronomer: b. Decorah, Iowa, 20 Feb. 1861. He was graduated from the University of Wisconsin in 1884, was assistant astronomer at the Washburn Observatory, 1884–87, and from the last-named year until 1890 he held an astronomical post at the National Observatory at Cordoba, Argentine republic, until 1890. He was professor of astronomy at the State University of Missouri, 1890–99. Since 1899 he has been professor of mathematics of the United States navy. He was director of the *Nautical Almanac* in 1907–10; also in charge of six-inch Transit Circle of the United States Naval Observatory in 1908–10. Professor Updegraff

was in charge of an eclipse party at Barnesville and Griffin, Ga., in May 1900, and in 1913–14 was in charge of geodetic and other scientific work in the American survey of Samoa. In 1915–17 he was on court-martial and other duty at the Mare Island Navy Yard. He is the author of several articles on professional topics.

UPERNIVIK, or **UPERNAVIK,** Greenland, a district in which is located Tasiusak, the most northerly settlement in the western hemisphere.

UPHAM, Charles Wentworth, American minister: b. Saint John, N. B., 1802; d. 1875. He graduated at Harvard (1821) and at the divinity school there (1824) to become pastor with Rev. John Prince in the Unitarian Church at Salem, Mass., remaining there until 1844. He was mayor of Salem (1852), president of the State senate (1857–58), and was representative in Congress. His voluminous publications dealt with the affairs of his time and he also was editor of the *Christian Review* and of the *Christian Register.*

UPHAM, Samuel Foster, American clergyman and educator: b. Duxbury, Mass., 19 May 1834; d. Madison, N. J., 5 Oct. 1904. He prepared for college at the East Greenwich Academy, and graduated from Wesleyan University in 1856. He immediately entered the ministry of the Methodist Episcopal Church joining the Providence, now the New England Southern Conference. He served parishes in Taunton, Mass., Pawtucket, R. I., New Bedford, Mass., and Bristol, R. I. In 1864 he was transferred to the New England Conference and served a church in Lowell, Mass., three separate churches in Boston, and one in Lynn, Mass., and in Springfield, Mass. In 1881 he was elected professor of practical theology in Drew Theological Seminary, Madison, N. J., where he taught until his death. He was a member of several general conferences and exerted a great influence therein. It is said that a great speech which he made led to the abandonment of the time limit in ministerial appointments. Over 1,400 students passed through his classes. His wit was proverbial and his speech epigrammatic. He was one of the greatest preachers of his generation. His father was for 70 years a minister, and his three sons all entered the ministry.

UPHAM, Thomas Cogswell, American clergyman and educator: b. Deerfield, N. H., 30 Jan. 1799; d. New York, 2 April 1872, although his residence was Kennebunkport, Me. After graduating from Dartmouth College in 1818 and Andover Theological Seminary in 1821 he served two years as assistant in Hebrew in the seminary. From 1823–25 he was associate pastor of the Congregational Church in Rochester, N. H. In 1825 he became professor of mental and moral philosophy in Bowdoin College, where he served until 1867. He was one of the very earliest advocates of International peace by peace tribunals. He was a voluminous author. The most important works from his pen are 'Ratio Disciplina, or the Constitution of the Congregational Churches' (1829); 'Manual of Peace' (1830); 'Philosophical and Practical Treatise on the Will' (1834 and several later editions); 'Elements of Mental Philosophy' (2 vols. 1839), An Abridged Ed. (1864); 'Outlines of Disordered Mental Action' (1840); 'Life and Religious Experience of Madame Guyon' (1847, 2 vols., 1851); 'Life of Faith' (1848, 1859); 'Principles of the Interior or Hidden Life' (published in 10 editions); 'A Treatise on the Divine Union' (1851); 'Religious Maxims' (1854); 'Life of Madame Catharine Adorna' (1856); 'Letters Æsthetic, Social and Moral, written from Europe, Egypt and Palestine' (1855; 2d ed., 1857); 'A Method of Prayer — An Analysis of the Work so Entitled by Madame Guyon' (1859); 'The Absolute Religion' (posthumous 1872). He also won the prize for his production on 'The Congress of Nations' (1840), and translated Jahn's 'Biblical Archæology' (1823) which passed through at least 12 subsequent editions.

UPHAM, Warren, American geologist: b. Amherst, N. H., 8 March 1850. He was graduated at Dartmouth in 1871; served on the geological survey of New Hampshire, 1875–78; on the geological survey of Minnesota in 1879–85; also 1893–94; and on the United States Geological Survey in 1885–95. After the last-named date he was secretary and librarian of the Minnesota Historical Society in Saint Paul until 1914, and has since been its archæologist. He has published 'The Glacial Lake Agassiz'; 'Greenland Icefields and Life in the North Atlantic, with a New Discussion of the Causes of the Ice Age' (with G. F. Wright, 1896); Volume I, 'Description and Explorations,' of 'Minnesota in Three Centuries' (1908), etc.; and has edited Volumes VIII to XV (1895–1915) of the Minnesota Historical Society Collections. He is also author of many geological reports and papers in scientific and historical magazines, chiefly relating to glacial subjects and to Minnesota history.

UPJOHN, Richard, American architect: b. Shaftesbury, England, 22 Jan. 1802; d. Garrisons, N. Y., 16 Aug. 1878. He emigrated to the United States in 1829 and took up his residence in New Bedford, Mass. On being appointed to direct the alterations in Trinity Church, New York, he left Boston, where he had been engaged on the designs for the courthouse for that city, and settled in New York, where he drew the plans for the Trinity Church of today, completed in 1846 and then considered the handsomest church in the United States. He also built the Church of the Ascension, the Church of the Holy Communion, Trinity Chapel, Saint Thomas' Church, and others in New York, Saint Paul's Church, Buffalo, and the Church of the Pilgrims and Grace Church in Brooklyn. For 20 years he was president of the American Institute of Architects. His civic architecture was chiefly that of Italian Renaissance, while his domestic buildings were of various styles.

UPJOHN, Richard Mitchell, American architect, son of the preceding: b. Shaftesbury, England, 7 March 1828; d. Brooklyn, N. Y., 1903. He came to this country from England with his parents in his infancy and became a partner with his father when 20 years old. Among the many buildings erected with his cooperation are the Madison Square Church, the old Mechanics' Bank in Wall street, Saint

Peter's Church, Albany; the Central Congregational Church, Boston; Park Church, Hartford, Conn.; Saint Paul's Protestant Episcopal Church, Brooklyn, and Trinity Parish School, New York. His chief work was the State Capitol in Hartford, Conn., and he had frequently been employed as an expert on civic, State, and national commissions. He was a member of the American Institute of Architects since its foundation and was president of the New York Chapter for two years. He was also a member of the Architectural League, an officer ot the Architectural Department of the Brooklyn Institute of Arts and Sciences, and a life member of the Metropolitan Museum of Art.

UPLAND PLOVER, a sportsman's name for the Bartramian sandpiper. See SANDPIPERS.

UPOLU (oo-pō-loo') **ISLAND.** See SAMOAN ISLANDS.

UPPER ALTON, Ill., city, Madison County, on the Chicago, Burlington and Quincy and the Chicago and Alton railroads, two miles northwest of Alton. It is in an agricultural region. There are roof-tile works, a machine shop, grist mill and other manufactories connected with the shipping of farm products. The educational institutions are the Shurtleff College (Baptist), opened in 1827 and chartered in 1835; a high school, opened in 1885 and public elementary schools. The Shurtleff College had, in 1917, 15 professors and instructors, and 126 students. The library contained 20,000 volumes, the productive funds amounted to $176,000 and the total income to $26,766. Pop. 2,918.

UPPER CANADA. See ONTARIO.

UPPER HELDERBERG GROUP, a discarded term in geologic chronology, applied to the lower members of the Mid Devonic formations — the Schoharie grit and the Onondaga or corniferous limestone. The term was derived from the Helderberg Mountains, where these rocks form the highest limestone members, while other limestones termed the Lower Helderberg group formed the basal limestone strata. To these latter, now classed as Lower Devonic, with the exception of the Manlius limestone, the name Helderbergian is now restricted. See DEVONIAN; OLD RED SANDSTONE.

UPPER IOWA UNIVERSITY, located at Fayette, Iowa. It was established as Fayette Seminary in 1857, and the name was changed to Upper Iowa University in 1858. It is supported and controlled by the Upper Iowa Conference of the Methodist Episcopal Church. It has been open to men and women on equal terms from the first, and a third of the graduates have been women. The organization includes the College of Liberal Arts, the Academy, the Normal School, the Conservatory of Music, a school of art, the School of Oratory, the Business College, the School of Physical Culture, and the Summer School. The College of Liberal Arts offers a classical, a philosophical, and a scientific course, and confers the three degrees of A.B., B.Ph. and B.S. The library contains 16,000 volumes; the students number about 400 and the faculty 17 members.

UPPER SANDUSKY, Ohio, village, county-seat of Wyandot County, on the Sandusky River, and on the Pennsylvania and the Columbus, Hocking Valley railroads, about 60 miles north by west of Columbus and 57 miles south by east of Toledo. It is in an agricultural and stock-raising region. The chief manufacturing establishments are machine shops, wagon and carriage works, foundries, flour mills, steam pumps and laundry machine works. The educational institutions are a high school, established in 1872, public and parish schools and a public library. There are two banks and two daily newspapers. Pop. 3,779.

UPPER SENEGAL AND NIGER, French West Africa, a colony formed in 1904 from the territories of Senegambia and the Niger, acquired in 1893. It extends south of Algeria to the northern boundaries of Dahomey, Togo, the Gold Coast and the Ivory Coast, with the Military Colony of the Niger on the east, and on the west Mauritania, the Falémé river and the frontier of French Guinea. The area is about 568,273 square miles. It includes a large part of the Sahara Desert below the Algerian boundary, the Upper Senegal Valley, over two-thirds of the course of the Niger River and all the countries in the Great Bend. The region is largely plateau land, rising to a height of 1,600 feet. Forests occur, but the land mainly is open and well adapted to agriculture and stock raising. The natives cultivate corn, rice, cotton, millet and ground nuts, and large herds of cattle abound. Native manufactures include pottery, bricks, jewelry, leather and woven goods. The export trade in 1916 amounted to $62,000 and consisted of cotton, rubber, fruits, oil seeds, oil cacao and timber; imports, chiefly food stuffs, cotton goods, mechanical implements and beverages amounted to $193,119. The Senegal-Niger Railway extends 349 miles from Kayes to Koulikoro, whence small steamers ascend the river to Timbuktu. Timbuktu has wireless telegraphic connection with the Eifel Tower in Paris and telegraph lines extend throughout the colony from Kayes to Niamey, Zinder and Lake Tchad. The colony is under civil administration with colonial judicial and educational systems. The chief towns have regional or urban schools; at Bamako is a school for sons of chiefs and a professional school; at Timbuktu is a Mohammedan superior school. The principal towns are Ouaghadougou (pop. 19,330); Bobo-Dioulasso (pop. 8,740); Bamako, the capital (pop. 8,734); Sikasso (pop. 7,825); Segou (pop. 8,400); Kayes (pop. 5,820); Djenné (pop. 5,450); Timbuktu (pop. 4,270); Goundam (pop. 3,200); Dori (pop. 3,400). Including 1,314 French, the total population of the colony is 5,598,973.

UPSALA, or **UPPSALA,** oop-sā'lā, Sweden. (1) A university town situated on the Fyris River near the head of a navigable branch of Lake Mälar, 50 miles north of Stockholm. The most prominent building is the Gothic cathedral, built in 1260–1435, and restored in 1886–93. It contains the tombs of several Swedish kings. The main building of the university is a fine Renaissance structure built in 1879–87. The university was founded in 1477. It had 2,347 students in 1915, a library of 350,000 volumes and 12,500 manuscripts, large collection of coins and paintings, a botanical garden and museum, with a statue of Linnæus, and an astronomical observatory. It is an important railway junction and there is a large

annual fair. The old city was wholly destroyed by fire in 1702. Pop. 27,976. (2) A lan or district of over 2,000 square miles area, with a population of about 132,716. Its eastern front is on the Baltic Sea and the Gulf of Bothnia, and it adjoins Stockholm on the south.

UPSETTING THERMOMETER. See THERMOMETER.

UPSHUR, ŭp'shĕr, Abel Parker, American statesman: b. Northampton County, Va., 17 June 1790; d. Potomac River, near Washington, D. C., 28 Feb. 1844. He was admitted to the bar in 1810, practised law at Richmond, Va., in 1810–24 and in 1825 served in the Virginia legislature. He was appointed judge of the general court in 1826, was a member of the convention to revise the State constitution in 1829, and then resumed his office as judge, serving until 1841, when he accepted the appointment as Secretary of the Navy under President Tyler. On the resignation of Daniel Webster in 1843 he became Secretary of State, in which capacity he favored the pro-slavery party and also supported President Tyler's policy of annexing Texas. On 28 Feb. 1844, in company with the President and his party, he visited the war steamer *Princeton* on the Potomac River to witness the testing of a large gun. It exploded in the experiments and Secretary Upshur, together with several others of the party, was killed.

UPSHUR, John Henry, American naval officer: b. Northampton County, Va., 5 Dec. 1823; d. 30 May 1917. He was educated at William and Mary College, entered the navy in 1841, served in the Mexican War and participated in the capture of Vera Cruz. He was graduated from the Naval Academy at Annapolis, Md., in 1848, accompanied the Perry expedition to Japan in 1854, and in 1857–59 was flag-lieutenant on the African squadron. He was an instructor at the Naval Academy at the beginning of the Civil War and was assigned to the South Atlantic squadron, with which he remained until 1862. He was then transferred to the North Atlantic squadron, was present at the engagements of Forts Royal and Hatteras and participated in the capture of Fort Fisher in 1865. He received promotion to commander in 1866, captain in 1872, commodore in 1880, was in command of the New York Navy Yard in 1882–84, and in the latter year was made rear-admiral in command of the naval forces of the Pacific. He was retired in 1885 at his own request.

UPSON, Anson Judd, American educator: b. Philadelphia, Pa., 7 Nov. 1823; d. Glens Falls, N. Y., 15 June 1902. He was graduated from Hamilton College, Clinton, N. Y., in 1843, and taught there until 1870, occupying the chair of logic and rhetoric in 1853–70. He was ordained in the Presbyterian ministry in 1868, and in 1870–80 was pastor of the Second Presbyterian Church at Troy, N. Y. In 1880 he was appointed to the chair of sacred rhetoric at Auburn Theological Seminary, in which office he remained until 1887, became vice-chancellor of the University of the State of New York in 1890, and from 1892 until his death was chancellor. He published 'Inquiry into the Nature and Character of our Federal Government' (1840).

UPTON, Emory, American soldier: b. Batavia, N. Y., 27 Aug. 1839; d. San Francisco, Cal., 14 March 1881. He was graduated at West Point in 1861 and soon became lieutenant of the Fifth artillery. While serving on the staff of General Tyler he participated in the first battle of Bull Run, where he was wounded, and in the Peninsula and Maryland campaigns of 1862 (qq.v.). In October 1862 he was commissioned colonel of the 121st New York volunteers. He fought at Fredericksburg, and from Gettysburg to the Wilderness commanded a brigade of the Sixth corps, distinguishing himself at the battle of Rappahannock Station (q.v.), and especially at Spottsylvania Court House (q.v.), where he was wounded. For gallantry in the last-named action he was promoted brigadier-general of volunteers and brevetted lieutenant-colonel in the regular army. He participated in the Shenandoah campaign, was wounded at the battle of the Opequon (q.v.) and was brevetted major-general of volunteers. Later he served in Georgia and Alabama in command of the Fourth cavalry division under Gen. J. H. Wilson, and for his services at Selma was brevetted brigadier-general in the regular army. From 1868 to 1880 he served as lieutenant-colonel of the 25th infantry, and in the latter year was made colonel of the Fourth artillery. He originated a system of military tactics which was adopted by the government in 1867, and was commandant of cadets at West Point, 1870–75. Soon after attaining his colonelcy in the regular army he suffered from mental disease and committed suicide. His publications include 'A New System of Infantry Tactics' (1867); 'Tactics for Non-Military Bodies' (1870); 'The Armies of Asia and Europe' (1878); and 'The Military Policy of the United States.' Consult Michie, 'Life and Letters of Major-General Emory Upton' (1885).

UPTON, George Putnam, American musical critic: b. Boston, 25 Oct. 1834. He was graduated from Brown University in 1854 and entered journalism in Chicago a year later. He was musical critic and editorial writer on the Chicago *Tribune* for 25 years. He published 'Letters of Peregrine Pickle' (1870); 'Lives of Haydn, Beethoven, Wagner and Liszt'; 'Standard Operas' (1890); 'Standard Oratorios' (1891); 'Standard Symphonies' (1892), etc.

UPTON, William W., American jurist: b. Victor, N. Y., 17 July 1817; d. Washington, D. C., 23 Jan. 1896. In 1838 he went to Michigan where he studied law and held various offices, being a member of the legislature which located the capital at Lansing. He went to California in 1852 and was a member of the California legislature in 1856. He was prosecuting attorney of Sacramento County, 1861–64. He moved to Portland, Ore., in 1865, whence he was almost immediately elected to the legislature. In 1867 he became a justice of the Supreme Court and became chief justice in 1872. In the Presidential election of 1876 the Republicans based their claim to the Oregon vote upon a telegram of Judge Upton, in which he called attention to the fact that the governor of Oregon could not exercise judicial powers in passing upon the eligibility of an elector. The Electoral Commission sustained

this contention, and Hayes became President. In 1877 Judge Upton was appointed second comptroller of the United States Treasury, which position he held until his resignation in 1885, during which time he passed finally upon nearly 160,000 accounts, involving about $160,000,000. In 1885 the government published his "Digest of Decisions of the Second Comptroller of the Treasury, 1869 to 1884."

UPTON, Winslow, American astronomer: b. Salem, Mass., 12 Oct. 1853. He was graduated from Brown University in 1875, studied astronomy at the University of Cincinnati and in 1877–79 was assistant astronomer at the Harvard Observatory. He was engaged in the United States Lake Survey as assistant engineer in 1879–80, was computer and assistant professor in the United States Signal Service in 1881–83, and has since been professor of astronomy at Brown University, where he was also dean in 1900–01. He served on the United States eclipse expeditions of 1878 and 1883, and was a member of private expeditions in 1887, 1889 and 1900. In 1896–97 he was absent on leave from Brown while making observations at the Southern station of Harvard Observatory at Arequipa, Peru. He has published 'Star Atlas' (1896).

UPTON, Mass., town in Worcester County, on the Grafton and Upton Railroad, about 35 miles west by south of Boston and 12 miles southeast of Worcester. The town contains the villages of Upton Centre and West Upton. The chief industries are connected with farm products and the manufacture of straw hats. Pop. about 2,071.

UR OF THE CHALDEES. The home of the family of Abraham and the place from which he set out to find a location for his family. It was the old Babylonian city of Uru, situated on the right bank of the Euphrates River, 135 miles southeast from Babylon. It was a great and prosperous city, a centre of transportation routes by land and water, and the seat of worship of Sin the Moon God. Its modern name is Mûkayyar or Mugheir. Its history has been traced as far back as 3,000 B.C. The ruins were first discovered by Taylor in 1853. Excavations in many places reveal the name and influence of Ur. The ruins are owned by Saadun, the sheik of the Montefik Arabs.

URABA, oo-rä-bä', **Gulf of.** See DARIEN, GULF OF.

URÆMIA, a toxic condition caused by the presence in the blood of urinary constituents which normally should be secreted by the kidneys. The nervous system is especially affected by the poisonous blood, as shown by mental disturbances, convulsions, headache, nausea, dyspnœa, disordered vision and coma. What the toxic material really is has not been determined. It has been proved not to be urea alone, as was formerly believed. Some contend that the poison is a mixed product of uneliminated nitrogenous excrementitious substances; others, that it is a newly formed albuminous substance not related to ordinary waste material, or is due to a disturbance of an internal venal secretion brought about by changed metabolic processes. Uræmia is usually associated with acute or chronic nephritis, or may result from suppression or deficient secretion of urine from any cause.

The symptoms of uræmia depend upon whether the condition is acute or chronic. Acute uræmia may begin with a violent headache or persistent vomiting, with dyspnœa, convulsions, mania or coma. There may be only one of these symptoms present, or two or more may appear. The headache is usually occipital, and may be associated with deafness. The vomiting may be accompanied by diarrhœa, both being efforts to excrete the toxic material. The dyspnœa is frequently continuous and severe; the patient cannot lie down or sleep in any position with comfort; there is much restlessness and tossing about; the legs, if resting on the floor, readily swell from œdema. There is always a probability of pulmonary œdema and cyanosis of the face and extremities. Whenever sudden uncontrollable vomiting occurs without a known cause, or a severe and more or less continuous headache appears, uræmia should be suspected and the urine examined. The temperature in acute uræmia may be but little increased, or may rise 5° to 6° F. just before a paroxysm. The pulse varies, depending upon the condition of the heart and arteries; it may be full and throbbing, or small and hard and not especially rapid. The convulsions resemble those of epilepsy, but are not attended by a cry. They may come without warning or be preceded for a few days by twitching of the muscles of the face and hands; and may occur frequently and persistently until coma ensues. Amaurosis may follow these convulsions for a few days, or hemiplegia or monoplegia may follow or precede them. The delirium of acute uræmia may be mild, muttering, or it may be maniacal. Coma is commonly present when there are general convulsions, and may appear without them, sometimes preceded by headache and dullness. The breathing is stertorous and the breath foul. The patient may recover from the stupor or may remain in it for weeks.

In chronic uræmia the patient complains of severe occipital or frontal headache, more or less continuous. There is dyspnœa not dependent on exertion. There may be nausea, vomiting, diarrhœa and stomatitis. The breath is foul, the tongue coated with a brown offensive fur. The urine is usually increased in amount, is clear, acid, has a specific gravity of 1006 to 1010, contains albumen at variable periods, also a few hyaline or granular casts, and sometimes red blood-corpuscles and leucocytes. The urea is often diminished.

The symptoms of chronic uræmia may last for months, but acute exacerbations with convulsions and coma may appear at any time, and such cases are susceptible to inflammation of the pericardium, pleura, meninges and endocardium. Melancholia and delusional insanity may occur. The skin frequently becomes dry and itches, and muscular cramps are common.

Uræmia must be distinguished from typhoid fever, alcoholism with coma, and from some forms of diabetes and meningitis. The prognosis of uræmia is not good, especially in albuminuria patients, and those having advanced heart disease or arteriosclerosis; but patients may recover when apparently hopelessly sick.

Treatment.— Keep the patient in bed and between blankets, especially in acute attacks;

prevent him at all times from being chilled; induce free action of the skin by the hot pack, the hot air or steam bath, or the hot tub bath; and keep the bowels free by saline purges. Diuretics, such as water (considered by many as the best diuretic), lemonade with cream of tartar, the liquor ammoniæ acetatis, and the citrate of potassium, cannot be dispensed with. Cupping and poulticing of the loins (if the urine is scanty), venesection and hot saline injections are advocated. Sometimes heart stimulants, such as camphor, strychnine, digitalis and strophanthus are necessary. During convalescence tonics may be given and careful outdoor exercise resorted to, the patient being comfortably clad. In most cases the use of alcohol and tobacco should be interdicted. The diet is of prime importance. In acute uræmia it should be solely of milk, with seltzer, vichy or kumiss. In the chronic form this should be the chief mode of administering food. As improvement sets in the patient may have meat broths, gruels, egg-albumen, custards, toast, baked potatoes, cereals, soft-boiled eggs, fresh fish, etc. Most authorities believe that red meats should not be given until the amount of urea found in the urine is about normal.

URAGA, oo-rä'gä, Japan, a seaport town of Hondo, in the Sagami province, 16 miles southeast of Yokohama. Perry Park opened in 1900 at Kurihama, a suburb, commemorates the advent of Commodore Perry's fleet at Uraga in 1853 and the negotiations which led to the opening up of Japan again to foreign commercial and political relations. Pop., 13,000.

URAL-ALTAIC LANGUAGES, a family of languages of which two grand divisions are recognized by Max Müller, the Northern and the Southern. In the northern division are comprised the Tungusic, the Mongolic, the Turkic, the Finnic and the Samoyedic. The Tungusic dialects, lowest of all these in organization, extend northward and westward from China. Of a grade a little higher are the Mongolic dialects of China: in these the different parts of speech are hardly distinguished. But the Turkic dialects, chief among them the Osmanli of Constantinople, are rich in grammatical forms; Turkic speech is common from the Polar Sea to the Adriatic. The Finnic division comprises the speech of the Baltic coasts and the Hungarian or Magyar. (See FINNS; HUNGARY). Among the languages of the southern division are the Tamulic or Dravidian dialects of southern India (see TAMIL); the Tibetan, the Taic or the dialects of Siam, and the Malaic or Malayan and Polynesian dialects. The Ural-Altaic languages all possess one characteristic feature; in them the radical or root is never obscured; also the determining or modifying syllables are usually placed at the end; the vowels in a word may be changed and modulated to harmonize with the keynote struck by its chief vowel. In the Turkish, for example, if a verb contains a sharp vowel in its radical portion, the vowels of the terminations are all sharp; but the same terminations when they follow a root with a flat vowel, modulate their vowels into a flat key; thus *mek* or *mak* being the infinitive termination of verbs, *sev-mek* is the infinitive verb to love, but *bak-mak* is the infinitive verb to regard. The Ural-Altaic languages are sometimes called Turanian, also Finno-Tatar.

URAL (oo'rąl or ū'rąl) **MOUNTAINS,** Russia, a long mountain range forming the conventional boundary between Europe and Asia, and extending in a nearly north and south direction from the Arctic Ocean to the Caspian Sea, a distance of about 16,000 miles. The average height of its crest is 1,000 to 1,500 feet, but several peaks are over 5,000 feet, the highest, Telpös, in the northern part of the chain, having an altitude of 5,433 feet. In the north the range forms a comparatively narrow ridge, destitute of trees. Further south it is covered with forests and spreads out to a width of nearly 200 miles, finally dividing on the southern boundary of Orenburg into a western and a southern outrunner, the latter known as the Mugadzhar Mountains, reaching to the Aral Sea. The principal rivers fed by the Ural chain are the Petchora and numerous affluents of the Obi, belonging to the Arctic Ocean; and the Kama and Ural, belonging to the Caspian. The geological structure consists of an axis of granite and poryphry, covered on the slopes with palæozoic strata. The mineral wealth is very great, especially in the central portion. The range is one of the principal sources of platinum, and gold is also found in places, iron is common, besides silver, lead, copper, rock salt and occasionally diamonds and precious stones. Considerable coal is mined in the western area, and in time there should be a wide development of manufacturing industries. The iron output before the war for several years averaged over 20,000 tons.

URAL RIVER, Russia, a river which rises in the Ural Mountains in the northern part of the government of Orenburg, flows first south, then west, past Orenburg so far as Uralsk, then again south through the Uralsk district, emptying into the Caspian Sea through several mouths. It is 1,485 miles long and navigable to Orenburg for vessels of considerable size. Its sturgeon fisheries are important.

URALITE, a mineral which is a variety of amphibole and is produced by the alteration of pyroxene; found abundantly in the Ural region, Russia.

URALSK, oo-rälsk', Russian Central Asia. (1) The capital of the district of Uralsk, situated on the Ural River, at the foot of the mountains, 160 miles southwest of Orenburg and 280 miles north of the Caspian Sea, on the railroad between Orenburg and Saratov. It has numerous churches, two high schools, a library, a museum and a theatre, steam mills, brick kilns and a brewery. Pop. about 47,880. (2) The district bounded by Orenburg on the north, Turgai and the Caspian Sea on the east, Astrakhan on the west and the Transcaspian territory on the south. It is a desert country, lying largely below sea-level. The Ural River region, however, is fertile. A promising oil field was opened at Emba in 1915. The area is 137,679 square miles. Population 889,600, or only 6.4 to the mile.

URANIA, ū-rā'nĭ-ą, the "heavenly one," a title of Aphrodite, as the goddess of noble love, but more commonly the name of the muse of astronomy, a daughter of Zeus and Mnemosyne. She is generally represented with a

crown of stars, in a garment spotted with stars, and holding in her left hand a celestial globe or a lyre. By Apollo she was mother of Hymenæus and Linus. She was also the muse of astronomy. See MUSES.

URANIIDÆ, a family of moths. See MOTH.

URANINITE, URANIN, or PITCHBLENDE, a dark-green to black mineral belonging to the isometric or cubical system. Usually occurs in a massive condition. Brittle, hardness 5.5; specific gravity, 6.4 to 9.7; lustre, submetallic and greasy or pitch-like; streak, brownish-black to dark olive green; fracture, conchoidal; composition: an oxide of uranium that may be considered a uranate of uranyl. It also contains some lead and very small amounts of other elements, among which are radium (q.v.) and the rare gaseous elements, helium. Pitchblende is the chief commercial source of uranium and radium. It is mined in considerable quantities at Joachimsthal in Bohemia. Found also in many other places, as Cornwall, Saxony, Hungary, Turkey and in the United States in Connecticut, North Carolina, etc.

URANIUM, a metallic chemical element, symbol U, atomic weight 238.5, specific gravity 18.6. It was discovered by Klaproth (1789) in the mineral pitchblende and named by him in honor of Herschel's discovery of the planet Uranus. The body discovered by Klaproth was really the oxide of uranium, the free metal being first isolated by Peligot (1842). It is one of the rarer elements and occurs in nature only in combination with other elements. The principal minerals containing it in any considerable quantity are *uraninite* or pitchblende (75 to 85 per cent U_3O_8), a greenish mineral coming chiefly from Joachimsthal in Bohemia, though found in other places; *gummite,* a hydrated calcium lead uranium silicate; *uranosphærite,* a hydrated bismuth uranite; *torbernite,* a hydrated copper uranium phosphate from Saxony and Cornwall; *autunite,* a hydrated calcium uranium phosphate from the same regions; uvanite, a hydrated compound of uranium and vanadium; and carnotite, a potassium uranium vanadate. Carnotite is the most important ore in the United States. The latter carries important amounts of radium (q.v.). Deposits are worked in Colorado and Utah. The most important European deposits are at Joachimsthal in Austria and at various points in Saxony. The metal is prepared by heating a mixture of uranium chloride, sodium chloride, and carbon or of uranium chloride, sodium chloride and metallic sodium. It is a malleable white metal looking like nickel. It oxidizes very slowly in the air at ordinary temperatures, but rapidly burns to U_3O_8 when heated above 400° F. Is soluble in mineral acids. It acts both as an acid and a basic element. We have *uranous* salts such as UCl_4, *uranyl* salts in which the group UO_2 acts as a basic radical, example uranyl chloride $(UO_2)Cl_2$ and *uranates* which are formed by the combination of the oxide UO_3 with strong bases. Sodium uranate, or uranium yellow, is used in glass and china painting and in the manufacture of beautiful fluorescent uranium glass. Metallic uranium and minerals containing its compounds possess marked radioactivity. See MINERAL PRODUCTION OF THE UNITED STATES; RADIUM.

URANOCIRCITE. A hydrous phosphate of uranium and barium, $BaO.2UO_3.P_2O_5.8H_2O$. Occurs near Keystone in the Black Hills of South Dakota and may become a source of radium.

URANOPHANE. A hydrons silicate of uranium and calcium. $CaO.2UO_3.2SiO_2.6H_2O$. Occurs in Georgia, Idaho and North Carolina and may be a source of radium.

URANOSPINITE. An arsenate of uranium and calcium with probable constitution of $CaO.2UO_3.As_2O_5.8H_2O$. Equivalent to 47.6 per cent uranium. Found in Cane County, Utah.

URANUS, ū'rą-nŭs, *in Greek mythology,* the son of Gæa, the earth, and by her the father of the Titans, Cyclopes, etc. He hated his children, and confined them in Tartarus, but on the instigation of Gæa, Kronos, the youngest of the Titans, overthrew and dethroned him.

URANUS, *in astronomy,* one of the primary planets, and the seventh from the sun, discovered by Sir William Herschel in 1781. For many years it was called Georgium Sidus in England. The name Uranus was given by Bode. To the naked eye it appears like a star of the sixth magnitude. Its mean distance from the sun is about 1,782 millions of miles, and the length of the year 30,686.82 days, or about 84 of our years. Its mean diameter is estimated at about 33,000 miles. Its volume exceeds the earth's about 67 times, but as its mean density is only 0.17 (the earth's being 1) its mass is only about 12½ times more. The length of its day is supposed to be between 9 and 10 hours. It has two small moons, one of nine, the other 13½ days period; and two still smaller satellites of four and two and one-half days period respectively. None of them are believed to exceed 500 miles diameter. They are named Ariel, Oberon, Titanic and Umbriel.

URAO. A natural sodium carbonate with composition $3Na_2O.4CO_2.5H_2O$. Of common occurrence in many lakes and lake deposits in the arid districts of western United States.

URATES, or LITHATES. Uric acid is sometimes called lithic acid and the salts of uric acid are therefore spoken of sometimes as *urates* or *lithates.*

URBAN, ėr'ban, the name of eight popes, given in the Latin as Urbanus, as follows:

URBAN I, Saint. He was the son of a Roman noble, Pontianus, and succeeded Calixtus I, in 222. He suffered martyrdom in 230.

URBAN II (OTHO, or ODO OF LAGNY): b. Chatillon sur-Marne, France, about 1042; d. Rome, 29 July 1099. He was a canon of Rheims, and a monk of Cluny where Gregory VII met him and invited him to Rome. He was soon after appointed cardinal and bishop of Ostia, and in 1088 he succeeded Victor III. The anti-pope Clement III was then in possession of Rome, but was obliged to flee in 1089. He returned in 1091 only to be again driven out in 1093 when Urban resumed possession of the city. At the council of Clement, in 1095, Urban preached the first crusade, and at the council of Bari in 1098 he attempted to bring about a union of the Greek and Latin churches. He maintained the validity of papal elections independently of the consent of Roman emperors, zealously enforced the law of priestly celibacy

and forbade the clergy to accept ecclesiastical offices from laymen.

URBAN III (UBERTO CRIVELLI, oo-bĕr'tō krĕ-vĕl'lē): b. Milan; d. Ferrara, 20 Oct. 1187. He was archbishop of Milan and succeeded Lucius III in the papal chair in 1185. He endeavored to send assistance to the Christians in the East, who were being sorely pressed by Saladoin, and after a struggle with Frederick Barbarossa was about to excommunicate that monarch when his own death intervened.

URBAN IV (JACQUES PANTALÉON, zhāk pän-tä-lā-ôń): d. Orvieto, Italy, 2 Oct. 1264. He was of French birth, the son of a shoemaker, and became successively canon of Liège, bishop of Verdun, and patriarch of Jerusalem. He succeeded Alexander IV in 1261. He excommunicated Manfred, king of Naples, and offered the crown to Charles, Count of Province and Anjou, and brother to Louis IX of France, which led to the subsequent wars of the Anjous for the possession of Sicily and Naples. He established the feast of Corpus Christi, first celebrated at Orvieto, 19 June 1264.

URBAN V (GUILLAUME DE GRIMOARD, gē-yōm de grē-mō-ăr): b. diocese of Mende, France, 1310; d. Avignon, France, 16 Dec. 1370. He was a Benedictine monk who became renowned as a professor of canon law and Scripture and was raised to the dignity of abbot of Saint Victor at Marseilles and papal legate. He succeeded Innocent VI in 1362. He restored the papal seat from Avignon to Rome in 1367, founded many churches, and was a profound student and the patron of scholars. He was the first Pope to bless a golden rose for princes.

URBAN VI (BARTOLOMEO PRIGNANO, bär-tō-lōm-mā'ō prēn-yä'nō): b. Naples, about 1318; d. Rome, 15 Oct. 1389. He was archbishop of Bari and chosen to succeed Gregory XI in 1378. The French cardinals dissatisfied with Urban withdrew to Anagni and there elected Robert of Geneva, who took the name of Clement VII, and took up his residence in Avignon. Thus was originated the famous "Western Schism" which endured for nearly 50 years. Urban has been characterized as of harsh and violent temper, but an impartial survey of history will rather credit him with being severe and rigorous in disposition, which his enemies interpreted for their own purposes.

URBAN VII (JOHN BAPTIST CASTAGNA, käs-tän'yä): b. Rome, 4 Aug. 1521; d. 28 Sept. 1590. He was archbishop of Rossano, cardinal and papal legate to Spain, and succeeded Sixtus V in 1590, but died 13 days after his election. He left his modest accumulations to be used as dowries for poor girls.

URBAN VIII (MAFFEO BARBERINI, mäf-fā'ō bär-bā-rē'nē): b. Florence, 1568; d. Rome, 29 July 1644. Under Gregory XIV he was governor of Fano, under Clement VIII papal prothonotary, and in 1604 became archbishop of Nazareth (*in partibus infidelium*) and ambassador to Paris. He became cardinal presbyter the next year and archbishop of Spoleto in 1608. He was elected successor of Gregory XV 6 Aug. 1623. He condemned the Jansenist tenets which then flourished in France, built the Collegium Urbanum or College of the Propaganda, established the Vatican Seminary, and issued the bull 'In Cœna Domini' in its present form. He also gave the cardinals the title of Eminence, regulated the number of feasts of obligation, put forth a revised breviary, and was the author of some Latin and Italian poems. Consult Ward, 'Copernicanism and Pope Paul V' (Dublin *Review* 1871); H. de l'Epinois, 'Les Pièces du Procès de Galileo' (1877).

URBAN DISTRICT COUNCIL, a local unit of administration under the English local government system, established by the Local Government Act of 1894. The district is usually circumscribed and in general was well defined as a sanitary improvement area previous to the act. England and Wales have about 825 urban districts with populations varying from 300 to 150,000. New districts are created by vote of the county electors approved by the Local Government Board. The members of urban councils are elected for three-year terms by popular vote, about one-third of the members retiring each year. The suffrage for the urban council elections is practically universal, including all men and women ratepayers and lodgers qualified as parliamentary electors. Women are eligible to membership of an urban council. The chairman is selected by the elected members, all of whom serve without pay. The jurisdiction of this local unit of government is chiefly over sanitation and public works. It also regulates public baths, libraries, parks and cemeteries in its territory, and in many cases owns and operates waterworks, gas and electric plants, street railways, etc. It levies a local rate for purposes of revenue and for large permanent improvements or public utilities it is empowered to negotiate loans, subject, however, to the approval of the Local Government Board. Consult Annual Report of the Local Government Board; Odgers, 'Local Government' (1901); and Redlich, J., and Hirst, F. W., 'Local Government in England' (1903).

URBANA, ėr-băn'ą, Ill., city, county-seat of Champaign County, on the Illinois Central, the Wabash, the Cleveland, Cincinnati, Chicago and Saint Louis railroads, about 70 miles east of Springfield, and 110 miles south by west of Chicago. It is in an agricultural region, and in the vicinity are valuable deposits of fire-clay. It was settled in 1824, incorporated 6 May 1833, and chartered as a city in 1860. The chief industrial establishments are the "Big Four" railroad shops, with 700 employees; brick works, 300 employees, and lawn mower and machine works, 50 employees. The principal public buildings are the county courthouse, municipal buildings, Y. M. C. A. building, the churches and schools. The educational institutions are the University of Illinois (q.v.), the Thornburn High School, public elementary schools and two libraries. There are three banks, two daily newspapers and several educational monthlies. The government is administered under a charter granted by the legislature, which provides for a mayor and a council of 10 members, who are elected annually. Pop. 10,250.

URBANA, Ohio, city, county-seat of Champaign County, on the Erie, the Pittsburgh, Cin-

cinnati, Chicago and Saint Louis and the Cleveland, Cincinnati, Chicago and Saint Louis railroads, about 13 miles north of Springfield and 45 miles west of Columbus. It is in an agricultural region. The chief industrial establishments are the United States Rolling Stock Company works, carriage and wagon factories, stove works, machine shops, agricultural-implement works, shoe factories, broom and furniture factories, woolen mills, straw-board works, water-wheel works, a tannery and a flour mill. The principal public buildings are the county courthouse, municipal buildings, churches and schools. The educational institutions are Urbana University (Swedenborgian), founded in 1850, a high school (building cost $125,000), public and parish elementary schools, public library and the library of the university. There are three banks and two daily newspapers. Pop. 7,739.

URBINO, oor-bē'nō, Italy, a town in the province of Pesaro e Urbino, on an isolated hill in the midst of bleak and desolate mountains, 21 miles west by south of Pesaro. It is the see of an archbishop, and the seat of a university with two faculties — jurisprudence, and mathematics and natural science. Among the buildings deserving of notice are the ducal palace, one of the finest edifices of the kind in Italy, and the cathedral. The chief industries are silk weaving, brickmaking, oil pressing and cheese and dairy factories. Sulphur mines are near by. Urbino is the birthplace of the painter Raphael. His house is still shown, and a statue of him was erected in 1897. From 1474 to 1626 Urbino was the capital of a duchy. Pop. of commune about 20,000; of province 270,000.

URD. See NORNS.

URDANETA, oor-dā-nā'tā, **Andres,** Spanish navigator: b. Villafranca, Spain, 1498; d. Mexico, 3 Nov. 1568. He was appointed by Philip II chief pilot of the expedition under Miguel Lopez de Legazpe (q.v.) for the conquest of the Philippine Islands. He sailed with the expedition from La Navidad, Mexico, 21 Nov. 1564 and after the capture of Cebu and Mindoro he returned to Mexico, where he died.

URDU, oor'doo, Hindustani language, the native name, now given to it by philologists, means "camp language," from the Turkish *urdu*, meaning camp. It is really the Hindi, a language of the Aryan family, with a multitude of Persian, Arabic and Turkish words introduced. These intrusions have in no wise altered or influenced the language itself, which, in inflectional and phonetic elements, remains a pure Aryan dialect. See HINDU.

UREA, or **CARBAMIDE,** $CO\begin{smallmatrix}/NH_2\\\backslash NH_2\end{smallmatrix}$, is a physiologically important compound, being one of the chief nitrogenous decomposition products of animal metabolism. It appears in large quantities in the urine of carnivora; the amount excreted by an adult human being is about one ounce in 24 hours. Urea is also present in small quantities in the blood, milk, perspiration, tears and other animal fluids. It does not occur to any great extent in the vegetable kingdom, although it has been detected in certain fungi, and in much smaller quantities in some higher plants.

Urea was discovered by Rouelle in 1773. Of historical interest is its synthesis by Wöhler in 1828, this being practically the first organic compound prepared by synthetic methods. Wöhler obtained it from an aqueous solution of ammonium cyanate. Urea may also be prepared (1) by treating phosgene ($COCl_2$) with ammonia; (2) by heating ammonium carbonate in a sealed tube at 140° C.; (3) by treating cyanamide ($CNNH_2$) with dilute sulphuric acid; (4) by passing a mixture of ammonia and carbon dioxide through a red-hot tube. On a commercial scale urea has been obtained (1) by conducting phosgene into a mixture of phenol and dilute sodium hydroxide solution; diphenyl carbonate ($CO(OC_6H_5)_2$) is formed which upon treatment with dry ammonia yields urea and phenol; (2) by the action of catalysts, such as oxides or hydroxides of iron, chromium, tin, lead, etc., upon solution of cyanamide under vigorous agitation (Brit. 17,018); (3) by the treatment of a strong solution of a highly soluble cyanide with ammonia and carbon dioxide under special conditions of temperature and pressure (Can. 182,746); (4) by heating ammonium carbamate in the presence of one or more catalysts, the carbamate being obtained from solid carbon dioxide and liquid ammonia (Brit. 24,042). Urea may also be extracted from urine by treating the concentrated liquid with oxalic acid, whereby the sparingly soluble oxalate is obtained; this is decomposed with calcium carbonate and filtered. The filtrate is decolorized with animal charcoal, concentrated and allowed to form crystals.

Urea crystallizes in rhombic prisms or needles which melt at 132° C. It is very soluble in water and alcohol, but insoluble in chloroform, ether, or ethyl acetate. Above its melting point it undergoes a series of changes yielding ammonia, biuret, cyanuric acid and other products. Nitrous acid, sodium hypochlorite, or sodium hypobromite decompose urea into nitrogen, carbon dioxide, and water. Heated with dilute acids or alkalis it breaks down yielding ammonia and carbon dioxide. With acids or salts it forms a series of addition compounds; with certain acids it forms condensation products or ureids.

The amount of nitrogen excreted in the urine in the form of urea is very often a measure of the extent of the decomposition of albuminoid substances in the body; methods have therefore been worked out by Mörner-Sjöquist, Pflüger-Bleibtreu and others, for the quantitative estimation of nitrogen liberated from urea in a known volume of urine. The urine is first freed from nitrogenous impurities by precipitation with either barium compounds, or with a mixture of hydrochloric and phosphotungstic acids. The filtrate containing urea in solution is decomposed into ammonia and carbon dioxide by heating with phosphoric acid, and the total nitrogen set free as ammonia is estimated by Kjeldahl's method.

Urea has been used to a certain extent in the manufacture of dyes, Benzo-Fast Scarlet being formed from simple derivatives of the compound. Its value as plant food in some instances has been conclusively demonstrated. Its compounds with naphthalene derivatives

have been used in therapeutics, and stabilized compounds of urea with starch and hydrogen peroxide have been prepared which give hydrogen peroxide when mixed with water.

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UREDINACEÆ, the family of minute parasitic plants called rusts. See FUNGI.

UREN, William Simon, lawyer and reformer: b. Lancaster, Wis., 10 Jan. 1859. He was educated in the public schools, after which he took a business college course and studied law at Denver, Col., where he was admitted to the bar in 1881. He practised law at Gunnison and Denver for a few years, then traveled for his health and in 1891 settled in Milwaukee, Ore.; in 1896 he resumed the practice of law as the senior member of the firm of Uren and Scheubel. When on his way to Oregon he was impressed by Henry George's «Progress and Poverty,» and was soon advocating the idea that the surest way to secure the adoption of the «single tax» was to institute the initiative, referendum and recall. His efforts in this direction have been so effective that he has been called the «Father» of the Initiative and Referendum. He was organizer and secretary of the Oregon Direct Legislation League (1892–1902); member of the Oregon House of Representatives (1896); organizer and secretary of the Oregon Direct Primary Nominations League (1894), and People's Power League of Oregon (1906 and 1908). He is a member of the American Political Association and the National Municipal League.

URETER, the right or left excretory duct of the kidney, which serves to convey the urine from the latter to the urinary bladder or cloaca. In man each ureter averages from 16 to 18 inches in length, and is of the average diameter of a goose-quill. It consists of three coats, an outer or fibrous, a middle or muscular, and an inner or mucous coat. The ureter on leaving its kidney passes behind the peritoneum or lining membrane of the abdomen, at the back of the latter cavity. It runs downward and inward from the lower part of the pelvis of the kidney, and enters the cavity of the bony pelvis (q.v.), passing downward and forward to open into the base of the bladder. The ureters open into the bladder each by a constricted orifice, and each in its course lies upon the psoas muscle. They derive their nerves from the inferior mesenteric, spermatic and hypogastric plexuses; and their blood-vessels form the renal, spermatic and other arterial trunks. See KIDNEYS.

URETHRA, the canal leading from the bladder to the external urinary opening, and serving for the excretion of the urine. In the male the urethra traverses the penis, and its length varies from eight to nine inches. In the female it is a narrow membranous canal attaining a length of about one and one-half inches with a normal diameter of about one-quarter inch. It is thus a much more complicated structure in the male than in the female, and its anatomy and relations have to be carefully studied by the surgeon in view of the diseases to which it is subject, and also in connection with the important operations of lithotomy and lithotrity (qq.v.). The urethra in man consists of three coats: a mucous, a muscular, and an erectile coat. In the female the urethra is capable of great distention, so much so that it may be artificially dilated so as to permit the removal of calculi from the bladder without further operation. See CALCULUS; STRICTURE.

URFÉ, Honoré d', French pastoral writer: b. Marseilles, 1568; d. Savoy, 1625. He was educated for the Church but turned to literature and produced his 'Astrée' in 1610, soon after his withdrawal to Savoy. The last two,— the fourth and fifth volumes,— appeared in 1627 as posthumous works. His aim throughout was the refinement of society and his influence was far reaching. Consult Fischer, W., 'Lafontaine and the Astrée of Honoré d' Urfé' (Philadelphia 1913).

URGA, oor'gä, or **BOGDO-KUREN,** Central Asia, a town, the capital of Northern Mongolia, on the Tola, at an elevation of 4,370 feet above sea-level. It contains several large Buddhist monasteries, occupied by about 10,000 monks, and is a sacred city of the Buddhists, the seat of a high priest or lama. With the exception of the monasteries and temples the town is dirty and ill-built. It is the seat of the Chinese administration of Northern Mongolia, and there is a separate Chinese quarter. It is also a considerable trading centre, lying as it does at the junction of highways between Kiakhta and Peking. Before the World War the annual importations averaged nearly $8,000,000 value, and the exports $5,000,000. The outgoing trade is mostly in wool, hides and furs. A branch of the Mongolian bank finances most of the commerce. Buddhist Lamaism is the prevalent religion. Estimated pop. 40,000, part of whom are nomadic.

URI, oo'ri, Switzerland, a canton in the central part of the country, bounded by the Schwyz, Glarus, Grisons, Ticino, Valais, Bern and Unterwalden, and extending from the southeastern shores of the Lake of Lucerne almost to the Italian frontier. Area, 415 square miles. Capital, Altdorf. The canton is traversed lengthwise by the narrow valley of the Reuss, which empties into the Lake of Lucerne, and which is hemmed in by lofty, glacier-covered mountains belonging chiefly to the Glarner and Urner Alps. Large numbers of cattle, sheep and goats are raised, and excellent cheese produced. The principal mechanical industry is the manufacture of explosives and ammunition. The canton is traversed by the Gotthard Railroad, and the tourist traffic is important. The inhabitants are chiefly Germans and Roman Catholics. Pop. 723,000.

URIAL, a wild sheep. See OORIAL.

URIBE, Antonio José, Colombian lawyer: b. Medellin, Colombia, 6 March 1869. He was educated at the universities of Antioquia and Bogotá, Colombia; was professor of the history of Spanish literature at the University of Antioquia in 1891–92. He was Secretary of Agriculture in 1891, member of Assembly in 1894 and from 1894 to 1911 was professor of civil and international law and of the history of diplomatics at the University of Bogotá, where in 1903–04 he also was rector of the faculty of law and political science in 1903–04. He has also served as counsel to the Ministry of Foreign Relations and in 1903–04 was Minister of

Public Instruction, president of the Senate in 1909 and of the House of Representatives in 1912. Mr. Uribe was one of the founders of the American Institute of International Law and is member of various European scientific and literary societies. His publications include 'Reseña historica de la literatura castellana' (1891); 'Código de minas colombianos' (1891–92); 'Estudio sobre las Servidumbres según los códigos civil y de minas de Colombia y la legislacion général comparada' (1894); 'Tratado de derecho civil colombiano' (1899); 'Anales diplómaticos y consulares de Colombia' (1900, 1901); 'El recurso de Casación' (1903); 'La reforma administrativa' (1903); 'Derecho mercantil colombiano' (1907); 'Historia de la Sociedad de San Vincente de Paul' (1908); 'Supremacía moral del pontificado' (1909); 'Anales de la Comisión legislativa' (1910); 'Discursos académicos y parlamentarios' (1912); 'Federico Ozanam, apóstol de la fé, apóstol de la verdad, apóstol de la Caridad' (1913); 'Nulidades y Retracto en las sociedades de minas' (1913); 'La instrucción pública en Colombia' (1913); 'El proyecto de código penal' (1913); 'Las misiones católicas en Colombia' (1913) and contributions to various legal and lay periodicals.

URIC ACID, $C_5H_4N_4O_3$, or

$$\begin{matrix} NH-CO \\ | \quad | \\ CO \quad C-NH \\ | \quad | \\ NH-C-NH \end{matrix} > CO,$$

occurs in the urine of carnivorous animals, and in much larger quantities in the excreta of birds, reptiles, snails and insects. It may be present either in the free state or as acid ammonium or sodium salt. It exists normally in the blood of birds, and as a pigment it has been detected on the wings of certain butterflies. In small quantities uric acid is a constituent of normal human urine in which it was first detected by Scheele in 1776. It is produced in the human organism in large quantities when foods rich in nucleo-proteids are used, although the enzymes present in the liver convert the bulk of this product into urea. Under certain abnormal conditions it accumulates in the system forming urinary calculi, chalkstones, and other concretions. The tissues and joints of gouty patients contain the sparingly soluble acid sodium urate.

Uric acid may be prepared from the excreta of reptiles or birds by treatment with a boiling solution of caustic soda. The product is filtered and the clear hot liquid is strongly acidified with hydrochloric acid. The precipitated uric acid is washed with water and dried. Prepared in this way the acid is a white powder which shows the crystalline structure under the microscope. It dissolves in glycerine, piperazine, propylamine and caustic alkalies, but is only sparingly soluble in water (one part in about 15,000 parts at 20° C., and in 1,800 parts at 100° C.). It dissolves in concentrated sulphuric acid without decomposition, and its molecular weight has been determined by the cryoscopic method, with this acid as the solvent. When uric acid is suspended in nitric acid, or chlorine water, and then evaporated to dryness, a yellow residue is formed which changes into purple-red when moistened with ammonia, or into violet with caustic soda; this is known as the "Murexide Test" and is employed for the detection of the acid.

Uric acid is a weak dibasic acid and may form a series of salts with the same metal. With sodium, for example, it forms 1) neutral sodium urate $Na_2C_5H_2N_4O_3$; 2) di-sodium urate $NaHC_5H_2N_4O_3$; and 3) quadrisodium urate $NaH(C_5H_2N_4O_3)$. $H_2(C_5H_2N_4O_3)$. The neutral urate is quite insoluble; the quadriurate is quite soluble; while the diurate may exist in *a* and *b* modifications. The *a* form is soluble and unstable, readily passing into the *b* form which is stable and less soluble. This property of diurates and some other characteristics of uric acid have led investigators to the belief that the compound has two structural formulas, the "lactam" formula given above, and the "lactim" formula which is tautomeric with the lactam structure.

Although uric acid is almost exclusively a product of animal metabolism, its close relation to compounds of vegetable origin has been clearly demonstrated. Chemically it is related to caffeine, the active principle in coffee, to theophylline, found in tea, and to theobromine, present in the cocoa bean. This keenship is strikingly illustrated by the relatively simple methods which have been successfully employed for the conversion of uric acid into these compounds.

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URIEL, ū'rĭ-ĕl, one of the archangels of the Hebrew Midrash and apocryphal Scriptures. The name means "the Light of God." Uriel is described as standing on the left hand of the throne of God, where he ministers light and forgiveness of sins to the children of Israel. He is introduced by Milton into 'Paradise Lost,' and also appears in Longfellow's 'Golden Legend.'

URIM and THUMMIM, in Hebrew ritual two appurtenances of the breastplate worn by the high priest. The two words, both plural, signify literally "lights" and "perfections"; in the Septuagint they are translated *delosis* (manifestation) and *aletheia* (truth), and in the Latin Vulgate *doctrina* (teaching or learning) and *veritas* (truth). In the Hebrew Scriptures the two words are inseparable save in 1 Sam. xxviii, 6, where Urim alone occurs. The first mention of Urim and Thummim is in Ex. xxviii, 30; the other passages in which they occur are Lev. viii, 8; Num. xxvii, 21; Deut. xxxiii, 8; Ezra ii, 63; Nehem. vii, 65. They appear to have served as an oracle through which the Divine Will might be ascertained. Jonathan Edwards writes that the High Priest's breastplate was called the breastplate of judgment because "in matters of judgment that were too hard for the judges they were to come to the Priest, who was to inquire of God by Urim and Thummim, in the breastplate, for a determination." The Jewish historian Josephus and some modern commentators teach that the Urim and Thummim are simply the 12 precious stones of the breastplate. Both Josephus and the ancient Rabbins held that those precious stones indicated the Divine Will by a preternatural luminousness. Renan, interpreting the existing Hebrew texts with the aid of the Septuagint, regards the instrument of the Urim and Thummim either as a sort of chessboard or as a

whirligig or rotating winged globe ('Hist. Peup. d'Isr.,' I, 275).

URINARY ANALYSIS, that branch of chemical and microscopical analysis which has to do with the detection or quantitative estimation of the constituents of urine. In practice, it is mostly concerned with the examination of the urine for such constituents as may have a known clinical significance. The average quantity of urine passed by an adult is probably about 50 fluid ounces (1,500 cubic centimeters) per day, though this may vary widely within the limits of health. The quantity is increased by drinking large amounts of water, and, temporarily, by the administration of diuretics; and it is decreased by unusual activity of the skin, as well as by several other causes. In general, the quantity of water taken into the system through the mouth must be equal, in the long run, to that which is eliminated through the kidneys, skin, bowels, lungs and nose. The specific gravity of the urine also varies to a considerable extent, the normal specific gravity, when the quantity passed is 50 ounces per day, being about 1.020. Any cause which tends to increase the quantity of urine secreted will, in general, decrease the specific gravity, and vice-versa; the total quantity of solid matter that the urine contains in solution being normally much less variable than the quantity of the urine itself. The specific gravity has a marked significance only when it is high without the urine being scanty, or low without the urine being copious. The ideal way to obtain a sample for analysis is to save what is passed throughout the 24 hours, mix it, and take the sample from the result. Urine thus obtained is technically called "mixed urine." It is often inconvenient to go to this trouble, especially in hot weather, when special care must be taken to prevent the mixed product from spoiling before the sample can be prepared and transmitted to the analyst; and it is, therefore, customary to take the sample from what is passed in the morning, experience indicating that a specimen taken at this time will correspond fairly well with mixed urine. Mixed urine should always show a slightly acid reaction, and the same is true of samples taken at any time during the day, except after a meal, when the reaction may be neutral, or even alkaline. Urine often contains slight clouds of mucus or other substances, which become visible after the specimen has been allowed to stand for a short time. These are usually of no clinical importance, merely indicating some slight irritation along the urinary passages, or some recent indiscretion in diet. After urine has been passed (and more quickly in hot weather than in cold) the urea that it contains decomposes and passes into the form of ammonium carbonate; and when the quantity of ammonium carbonate present is sufficient to make the reaction distinctly alkaline, the urine becomes semi-opaque from the deposition of a white cloud of phosphates, urates and other substances.

In the examination of a specimen of urine, the analyst cannot undertake to test it for every constituent that might conceivably be present as a pathological symptom. He will be guided by the general nature of the patient's illness, and will seek for those elements which may be of special significance. In the examination of presumably healthy candidates for life insurance it is customary to look for nothing but albumin and sugar, unless the specific gravity, when considered in connection with the quantity of urine passed, is high enough to indicate the presence of an abnormal amount of some other constituent. In general practice, however, it is often necessary to examine, not only for sugar and albumin, but also for pus, biliary coloring matters, blood-corpuscles and "casts" from the little uriniferous tubes of the kidneys. It is frequently important, too, to make a more or less accurate quantitative determination of the urea that is passed and sometimes of the chlorides also.

A "cast" may be formed in the kidney in any one of several ways, the simplest being by the direct exudation, into a little tubule of the kidney, of some coagulable constituent of the blood. After this becomes solidified, it may eventually become discharged from the tubule with the urine and pass into the bladder in the form of a microscopic plug of approximately cylindrical shape. To detect the presence of casts and of blood-corpucles and other undissolved constituents, the urine may be allowed to stand for some time in a conical glass vessel, whose sides slope down to an acute point at the bottom. After a couple of hours, or when it is judged that the solid constituents that may be present have settled to the bottom or risen to the top, or taken such other positions as may correspond to their specific gravities, a few drops are drawn off by means of a pipette from the surface and from the very apex of the glass at the bottom and also from such other levels as may appear to contain floating matters; and every sample so taken away is separately and carefully examined under the microscope. The correct identification of the different objects that such an examination reveals calls for a considerable amount of practical experience with the microscope. Much assistance may be derived, however, from Beale's 'One Hundred Urinary Deposits,' which gives engravings of all the ordinary deposits that the analyst will be likely to meet, including such extraneous things as fibres of wool and cotton and bits of feather, which often find their way into the specimen to be examined. In well-equipped offices and laboratories in which urine is analyzed, centrifugal machines (actuated by small electric motors) are used to separate the solid particles from the urine. This expedites the work greatly.

Albumin is not a normal constituent of urine and when it is present continuously and in any considerable quantity it constitutes a grave symptom. When present, it is in solution, and hence is not at all evident to the eye until it has been coagulated by the action of heat or some other agent. In testing a sample by heat a test tube is half filled with perfectly clear urine and heat is applied to the upper part of the liquid until boiling occurs. If the boiled urine becomes turbid in the least degree, the turbidity is due either to the presence of coagulated albumin or to the precipitation of the phosphates of lime and magnesia that are normally present in all urine. The earthy phosphates promptly redissolve upon the addition of a few drops of nitric or acetic acid; but if the turbidity is really due to albumin it does not

pass away upon this treatment. The object of heating only the top part of the test tube holding the urine is to facilitate the recognition of a precipitate, a comparison of the upper and lower parts of the test tube, in a good light, rendering the slightest loss of transparency quite visible. If no precipitate is obtained, a drop or two of nitric acid should be added and the boiling repeated. A number ot trials of this sort should be made, the nitric acid being added, a few drops at a time, until a considerable quantity of it is present. The consistent absence of a precipitate in all these tests indicates that albumin is not present. Physicians often make the serious error of adding too much nitric acid to the urine at the start. This is dangerous, because if any considerable quantity of nitric acid is added at the outset, it not infrequently happens that albumin will not be thrown down at all, even when much albumin is really present. The directions given above should, therefore, be followed implicitly, the urine being first boiled without any acid at all and then again after successive additions of a drop or two have been made, until as many as 15 or 20 drops have been added.

"Heller's test" tor albumin depends upon the fact that strong nitric acid throws down albumin from its solution, in the cold. In applying this test, a convenient quantity of strong, pure, colorless nitric acid is first placed in the bottom of a small test tube and an equal bulk of perfectly clear urine is allowed to flow down upon it gently, the test tube being inclined so that the urine may float upon the surface of the acid and not mix with it. If albumin is present, a sharp white zone appears at the surface of separation of the acid and the urine, the thickness of this zone varying with the quantity of albumin. When normal urine is treated in this manner, a brown ring is formed at the surface of separation. In cases of fever, or when there is an excessive amount of coloring matter of any kind present, the albumin in Heller's test may be tinted, so as to appear brownish, reddish, violet or greenish. Urates, when present in excess, also give a zone marked by a precipitate; but the precipitated urates differ from albumin in being soluble when the urine is cautiously warmed without being allowed to mingle with the acid to any great extent.

In testing urine for the presence of sugar the test is ordinarily made to depend upon the fact that diabetic sugar will throw down a yellowish or reddish precipitate of oxide of copper from an alkaline solution of copper sulphate and sodium (or potassium) tartrate. The test solutions that are ordinarily employed for this purpose are known, respectively, as "Fehling's solution" and "Pavy's solution" (qq.v.). In making a test, about one cubic centimeter of the test solution is placed in a test tube, diluted with about four times its own bulk of water and then boiled for a few seconds. If a precipitate is thrown down by this treatment, the test solution has spoiled and should be replaced by a freshly prepared one. If no precipitate is thrown down by boiling the test solution alone, the suspected urine should be immediately added, drop by drop. If any considerable quantity of sugar is present, a precipitate will be obtained almost immediately. In the absence of a precipitate, however, the urine should be added, a few drops at a time, with occasional heating, until the quantity added is about equal to that of the original, diluted test fluid. If no precipitate is obtained, sugar, clinically speaking, is absent. It should be observed that the formation of an actual precipitate must be observed in this test; the mere decolorization of the blue test solution being no criterion of the presence of sugar. Other methods are known for the detection and estimation of sugar in urine, but the copper test, as described above, is the one upon which physicians rely almost exclusively.

The nitrogen waste of the body passes away mainly through the urine, in the form of urea, CON_2H_4, and of compounds of uric acid ($C_5H_4N_4O_3$) with the alkalies and the alkaline earths. The approximate estimation of urea and uric acid is, therefore, often of considerable importance. The determination of urea by the well-known "hypobromite process" is based upon the fact that sodium hypobromite, NaBrO, decomposes urea quickly and completely in accordance with the equation $CON_2H_4 + 3NaBrO = 3NaBr + CO_2 + 2H_2O + 2N$. The sodium bromide (NaBr) that is formed remains in solution and the carbon dioxide (CO_2) that is liberated is absorbed by the test solution, which is made to contain a large excess of sodium hydrate. The only visible product of the decomposition is the nitrogen gas, which is collected and measured, and which serves to indicate the quantity of urea decomposed. The hypobromite solution is made from water, caustic soda and bromine. Various proportions are used, but Tyson recommends dissolving 100 grams of caustic soda in 250 cubic centimeters of water and adding 25 cubic centimeters of bromine to the solution so formed. In practice the reaction is carried out in a special form of apparatus which has a vertical graduated tube to collect and measure the nitrogen. The apparatus is first filled with the test solution and one cubic centimeter of urine is then introduced into it by means of a pipette. The decomposition of the urea begins at once, a copious stream of nitrogen bubbles passing up into the vertical collecting tube. In 20 minutes or less the reaction is complete and the number of cubic centimeters of free nitrogen is read from the graduated collection tube. For great refinement the volume of this gas must be corrected to standard conditions of temperature and pressure; but for ordinary clinical purposes this is not necessary and it is sufficient to read the number of cubic centimeters of gas directly from the apparatus. Multiplying this number by 0.00282, we obtain the number of grams of urea that the given cubic centimeter of urine contained; and upon multiplying this product again by the total number of cubic centimeters passed by the patient, we obtain the total number of grams of urea passed. The total amount of urea passed by a healthy adult may range from 20 to 40 grams per 24 hours.

In health, practically all of the uric acid in the urine occurs in combination with potassium, ammonium, sodium, calcium and magnesium in the form of salts known as "urates." Uric acid itself is highly insoluble, 14,000 parts of cold water dissolving only one part of the acid. To estimate the quantity that is present, 200 cubic centimeters of urine are acidulated by the addition of 20 cubic centimeters of nitric acid and set aside in a cellar or other cool place

for 24 hours. The nitric acid gradually replaces the uric acid in its combinations and the freed uric acid, owing to its insolubility, is deposited upon the sides and bottom of the beaker in the form of yellowish-red crystals. These may be collected, washed with cold distilled water and then dried and weighed; the weight so obtained giving the quantity of uric acid present in 200 cubic centimeters of the urine. In health, the quantity of uric acid passed by the kidneys in 24 hours may range from 0.4 to 0.8 gram. The heavy "brick-dust" deposit that is often observed in urine that has stood for a time, and which is frequently referred to in the advertisements of proprietary "kidney cures," for the purpose of terrifying the uninformed public into buying these "cures," consists mainly of urates, which are soluble at the temperature of the body but relatively insoluble at the ordinary temperature of a sleeping-room, and hence are likely to be thrown down. This sediment is found most commonly in urine that is somewhat more acid than usual. It also occurs in connection with defective assimilation of the food and is not to be regarded as of importance, unless it is markedly abundant or persistent; and even in these cases it points to an imperfect digestion rather than to trouble with the kidney. Consult Tyson, 'Practical Examination of Urine.'

ALLAN D. RISTEEN.

URINARY BLADDER. See BLADDER.

URINARY CALCULUS. See CALCULUS.

URINARY ORGANS, the organs concerned in the secretion and discharge of urine; namely, the kidneys, which secrete the urine; the ureters which convey it to the bladder; the bladder or hollow organ in which it is stored; and the urethra, by which it is passed out of the body. All of these organs are lined with a continuous mucous membrane. See BLADDER; KIDNEYS; URETER; URETHRA; URINE.

URINE, the fluid secreted by the kidneys, stored in the bladder and discharged by the urethra. It is an excrementitious fluid, ejecting from the system substances which if retained would impair health and destroy life (retention and suppression of urine). Healthy urine consists of water, urea, uric acid, hippuric acid, creatinin, phosphates, chlorides and sulphates, mucus and other ingredients. The abnormal matters found in the urine in various conditions include acetone, albumin, albumose, bile, blood, cystin, glucose, hemoglobin, fat, pus, spermatozoa, epithelial cells, casts, etc. (See URINARY ANALYSIS). Normal urine is a transparent aqueous fluid, of an amber color, acid reaction, a peculiar odor, and with a specific gravity of about 1.020 when passed in the average quantity of 50 ounces in the 24 hours. But each one of these characteristics is liable to some variations within the limits of health, as well as in disease.

As to transparency, it is quite constant, but cannot be considered an essential of normal urine, and on the other hand, because a given specimen of urine is transparent it is not necessarily normal. Urine transparent when passed frequently shows a faint cloudiness in some portion when standing, due to mucus, the slimy secretion from the mucous surface of the urinary organs. This cloudiness is most pronounced in the urine of females. Mucus can be filtered out, leaving the urine clear. Normal slightly acid urine may be somewhat turbid when passed from the presence of the earthy phosphates of calcium and magnesium, which after a time subside in the vessel, becoming a sediment. This sediment will disappear on the addition of a few drops of any acid, as nitric, but is increased by heat applied. Sometimes normal urine, on standing for a short time in a cold room, deposits a white or pink light sediment, the mixed urates of sodium, potassium, calcium and magnesium. This is believed to be due to the lowering of the temperature of the urine. Normal urine may also be somewhat turbid from the presence of alkaline carbonates. Pathologically, urine may be more or less opaque from abnormal degrees of the above conditions, or from the presence of pus, bacteria or fat, as in chylous urine, so called. As the result of disease the normal aqueous urine may become viscid or glutinous from the presence of mucus, or mucus and pus, etc. As to the color of normal urine, it is subject to considerable variation in health. As color is due to coloring matters in solution, it is deeper or paler according to the proportion of water present. For example, after much beer or water drinking the discharge of urine is large and the color very pale. When the skin is active, excreting much water in perspiration, the amount of urine is diminished and the color darker than usual; but in winter, when the skin is less active, the urine is increased in amount and is of lighter color. As the result of disease, there may be almost an entire absence of color, as in the copious urines of diabetes, hysteria and convulsions. Or it may be high colored in fevers and febrile states, due to a diminution in the amount of water and the addition of abnormal coloring matters such as blood, or blood-coloring matters or bile pigments. Certain vegetable matters, such as santonin, also color the urine.

The reaction of normal mixed urine or the urine of the entire 24 hours is always acid. Freshly passed urine at different times of the day shows usually a varying amount of acidity; but urine examined three or four hours after a meal may be neutral or even alkaline. The cause of this change is still doubtful. Urine allowed to stand for a short time, especially in a moderate temperature, sometimes increases in acidity. The cause is not definitely settled. Neutral and even acid urines standing for some time, especially in hot weather, become alkaline, have an ammoniacal odor, and are turbid, and sometimes an iridescent pellicle forms on the surface. The turbidity and sedimentary deposits are caused by the precipitation of the crystalline triple phosphate of ammonium and magnesium, the amorphous phosphate of lime, the urate of ammonium and by bacteria.

The peculiar and characteristic odor of normal urine becomes a "strong odor" in highly concentrated urines, a "putrescent" one when mucus and other organic matters are decomposed, an "ammoniacal" one when the ammonium carbonate has formed from the urea, or a sweetish one from the presence of sugar in the urine.

Certain substances ingested also give distinctive odors to urine, as turpentine producing

the odor of violets, and the odors of cubebs, copaiba and sandal-wood oil.

The specific gravity, though normally about 1.020, for 50 ounces of urine per 24 hours, when the skin is not acting freely and after copious use of water and diuretics, may descend to 1.010 or lower and yet be within the limits of health. Or when the urine becomes concentrated by the drain of water through the skin or some other channel the specific gravity may rise to 1.030 or higher. The normal range may be said to be from 1.005 to 1.030, but to be reliable, observation should be made on the entire quantity of urine passed in 24 hours. The specific gravity in diabetes mellitus sometimes reaches 1.050, and, according to Tyson, if in a copious urine the specific gravity is over 1.028 there is a suspicion of diabetes, and even if it is 1.010 or lower it is not safe to infer from this circumstance alone the absence of sugar. Specific gravity is also increased in the first stage of acute fevers, and of acute Bright's disease. It is lowered in hysterical complaints and in all forms of nephritis except the acute.

The quantity of urine is increased in diabetes mellitus and insipidus, in hysterical and convulsive conditions, in cardiac hypertrophy and all conditions which cause increased blood pressure, by the peripheral action of cold, etc. It is diminished in most forms of Bright's disease and in the early history of acute fevers and inflammatory conditions. Morbid conditions of the urine include glycosuria or glucosuria, oxaluria, albuminuria and phosphaturia. Consult Simon, E. C., 'A Manual of Clinical Diagnosis' (8th ed., Philadelphia 1914); 'Reference Handbook of the Medical Sciences' (New York 1915).

URINOMETER, an instrument for ascertaining the specific gravity of urine (q.v.). It is constructed on the principle of the hydrometer, usually graduated from 1,000 to 1,040, and indicates variations in the density of urine which are of great importance in the treatment of disease.

URIU, Sotokichi, oor-ī-yoo sō-tō-kē'-chē, Japanese baron and admiral: b. Kanazawa 1854. He entered the navy early and was sent to America for study. A bill introduced by Senator Frelinghuysen of New Jersey permitted Japanese to enter the United States Naval Academy at Annapolis and Uriu graduated with honors. Promoted to be captain, he was attaché at the French Legation in Japan, 1891–96 and afterward commanded some of the largest warships in the navy of Japan. He became rear-admiral in 1900. In 1904, outside of the harbor of Chemulpo, Korea, with his detachment he sunk the Russian warships *Variag* and *Korietz*. In this battle 100 Russians were killed and wounded, but neither ship or man on the Japanese side was hurt. He had an active part in the battles of 14 August, off Shantung and in the destruction of the Baltic fleet in the sea of Japan; was commandant at various naval stations, including Yokoska, 1909–12; and was made member of the Admiral's Council in 1909, in which year he and his wife revisited America. He retired in 1912.

URMY, Clarence (Thomas), American poet and musician: b. San Francisco, Cal., 10 July 1858. He is an organist and choirmaster, and his songs and other verses deal with California themes. He has published 'A Rosary of Rhyme' (1884); 'A Vintage of Verse' (1897).

URN, Cinerary. See URN BURIAL.

URN BURIAL, either the deposition of human ashes in a cinerary urn after cremation, or the enclosing of a dead body in two large urns placed mouth to mouth and sealed; both methods were employed in Grecian antiquity. The Grecian *pithos* or wine jar had a wide mouth, and in size and shape was like the large oil-jars of southern Europe. It was used as an urn to contain human ashes; and two such jars sometimes served as a rude coffin. Such coffins are found in ancient burying places in the Troad. See CREMATION OF THE DEAD.

UROCHORDA. See TUNICATA.

URODELA, or GRADIENTIA, a division of amphibians (see AMPHIBIA) comprising those in which the tail persists in adult life. The skin is naked and soft, and an exoskeleton is rarely present. The body is elongated, and most of them have the four limbs well developed, but in some the posterior limbs are wanting. The order is conveniently divided into:

(1) *Perennibranchiata,* which retain the gills throughout life: including the American *Necturus,* the blind *Proteus* of the underground caves of Varniola in Dalmatia, and the eel-like *Siren* of North America.

(2) *Derotremata,* in which the gills are lost in the adult, but there is usually a persistent gill-cleft: including the newt-like *Cryptobranchus* and the eel-like *Amphiuma* from North America, and the giant salamander, *Megalobatrachus,* of China and Japan.

(3) *Myctodera,* the salamanders and newts, in which the gills are lost and the gill-clefts closed in the adult: including the common newts or efts (*Molge*), the spotted and black salamanders (*Salamandra*) of the European Continent, and the American *Amblystoma,* the sexually mature larva of which is the well-known axolotl.

UROTROPINE, Hexamethylene tetramine, $(CH_2)_6N_4$ or $N\begin{cases} CH_2-N=CH_2 \\ CH_2-N=CH_2 \\ CH_2-N=CH_2 \end{cases}$, was discovered by Butlerow in 1860. It is obtained by treating formaldehyde or paraformaldehyde with ammonium hydroxide. The reaction mixture is cooled and then evaporated with the gradual addition of ammonium hydroxide. It is filtered, and the solid product which forms in the filtrate is purified by crystallization from alcohol.

Urotropine crystallizes in shiny rhombohedra. It melts at 165° to 175° C., dissolves readily in cold water, not so readily in hot water. It is also fairly soluble in alcohol and chloroform. When heated with acids it decomposes into ammonia and formaldehyde. It is a basic compound forming salts with a number of heavy metals, although its water solution does not react with litmus. Urotropine has been used as a uric acid solvent, and more extensively as an internal antiseptic. It has been made to combine with acids, alkyl haloids, iodine, phenols, metallic salts, etc., forming compounds that are used as antiseptics, dusting powders, disinfectants or uric acid solvents. Urotropine has also been used in conjunction

with sodium phenate, in gas masks as a protection against phosgene.

URQUHART, ėrk'ąrt, **David,** Scottish political economist: b. Brackhanwell, Scotland, 1805; d. Naples, Italy, 16 May 1877. He was educated at Oxford, entered the diplomatic service and later traveled extensively in the East. He was secretary of the British legation at Constantinople in 1835–36, but resigned that position because of his opposition to the policy of Lord Palmerston, which he considered as subservient to the ambitions of Russia. He was member of Parliament for Stafford in 1847–52 and maintained a vigorous opposition to Palmerston, his Parliamentary attacks supplementing his writings for the press, and succeeding in instilling into the public mind a distrust of Russia's eastern policy. His works include 'England, France, Russia and Turkey' (1835); 'The Spirit of the East' (2 vols., 1838); 'Progress of Russia in the West, North and South' (1853); 'Recent Events in the East' (1854), etc.

URQUIZA, oor-kē'thā, **Justo José de,** Argentine soldier and politician: b. near Concepción del Uruguay (now in Entre Rios, Argentina), 19 March 1800; d. there, 11 April 1870. He was of mixed Spanish and Indian blood and during the war in La Plata in 1835–42 gradually rose in influence until he became a general of division under Rosas, dictator of Buenos Aires. In 1844 he commanded the army sent against Uruguay, and in 1845, at the battle of India Muerte, he defeated Ribera. He was elected governor of Entre Rios in 1846, as leader of the federalist party. His administration of affairs was directed rather to his own glory and gain than to any benefit for the people, but he contrived to maintain a peaceful and prosperous condition of the country while strengthening his power, meanwhile acquiring great wealth. In 1851 he turned against Rosas, allied his forces with Brazil and Montevideo, and marched into Uruguay. He forced the capitulation of Oribe 8 Oct. 1851, then invaded Buenos Aires, and on 3 Feb. 1852 defeated Rosas at Monte Caseros. Urquiza was proclaimed provisional dictator and after the adoption of a federal constitution by the provinces (excepting Buenos Aires) he was in 1853 elected President for a term of six years. In 1859 he forced Buenos Aires to join the confederation, and after the expiration of his term of office took command of the army and endeavored to quell the revolt which had arisen in that country. He was defeated by Mitre at Pavon, 17 Sept. 1861, the result being the abandonment of the federalist constitution for the one since in force. He retired to Entre Rios, where he acted as governor, exercising semi-dictatorial powers, though nominally under the authority of the central government. In 1870 a formidable revolt arose, headed by his son-in-law, Gen. Lopez Jordan, and Urquiza was attacked in his palace and killed.

URSA MAJOR, ėr'są mā'jŏr, or **GREAT BEAR,** a northern constellation whose seven brightest stars are well known as Charles' Wain, the Plow, the Dipper, the Septentriones, and sometimes as the Butcher's Cleaver. Two of these seven stars are called the pointers, because they and the polestar lie nearly in a right line, and these stars direct an observer to the pole-star. The most conspicuous star of the constellation, Mizar, is noteworthy as being the first star discovered to be double or binary, and later the larger component was discovered to be also a twin. Ursa Minor, or Little Bear, a smaller constellation of the same configuration as Ursa Major, lies near the north pole, and includes the pole star.

URSIDÆ, the family of the bears (q.v.).

URSINUS (ėr-sī'nŭs) **COLLEGE,** located at Collegeville, Pa. It was incorporated in 1869, and was first opened to students in 1870; Freeland Seminary, whose property was purchased for the college, was incorporated into the college as its preparatory department; in 1871 a theological department was organized. The college is non-sectarian in its control, the board of directors being self-perpetuating; it is, however, affiliated with the Reformed Church in the United States, and the theological professors are ministers of that church. The organization of the college includes the College Department, the Academy, the School of Theology and the Summer Sessions. The School of Theology has been located in Philadelphia since 1898. The College Department offers six groups of studies, leading to the degree of A.B.; the groups are the classical, the Latin-mathematical, the mathematical-physical, the chemical-biological, the historical-political, and the modern language. The degree of A.M. is conferred for graduate work. In the School of Theology the regular course occupies three years; the curriculum, in addition to the ordinary theological curriculum, includes a lecture course in Sunday-school work, a complete course in the English Bible, a special course in the history of the Reformed Church, and a course in sociology; graduate courses are offered leading to the degree of B.D. The Summer Session offers courses of secondary and collegiate grade, work in the latter counting toward a degree. Women are admitted to all departments except the theological. The students in all departments in 1917 numbered 202, and the instructors 18, while the productive funds were $236,000, and the total income $72,475. There are 597 graduates at this date.

URSUA, oor-soo'ā, or **ORSUA, Pedro de,** Spanish soldier: b. Ursua, Navarre, about 1510; d. Machiparo, on the Upper Amazon, 1 Jan. 1561. He accompanied a Spanish expedition to New Granada, was governor of that country in 1545–46, and later led two expeditions from Bogotá in search of El Dorado. He commanded a force against the Cimarrones (fugitive slaves) on the Isthmus of Panama in 1555–57 and reduced them to subjection. In 1559 he was given command by the viceroy of Peru of an expedition to conquer the "kingdom" of the Omaguas, near the head of the Amazon. The purpose of the viceroy was really to rid himself of the unruly soldiers attracted to Peru by the civil wars. The ruse succeeded. Ursua adopted the title of "governor of Omagua and El Dorado" and set forth with several hundred of the turbulent soldiers in his train. He reached the Upper Amazon by way of the Moyobamba and the Ucuyali, but at Machiparo a conspiracy was

formed among his followers, led by Lope de Aguirre, and he was murdered.

URSULA, ėr-sū'lą, Saint, virgin martyr, according to the legend, a daughter of a prince in Britain. She was put to death at Cologne by a horde of Huns, some say in 384, others in 453, together with 11,000 virgins who accompanied her. According to another reading the number of her companions was only eleven. The Roman martyrology mentions the saint and her virgin companions without stating their number. Some bones, said to be those of herself and her companions, are still shown to visitors. The day dedicated to her honor is the 21st of October. Saint Ursula was the patroness of the Sorbonne. Consult Baring-Gould, 'Popular Myths of the Middle Ages'; Stein, 'Die Heilige Ursula' (1879).

URSULINE (ėr'sū-līn) **CONVENT AND ACADEMY OF SAINT LOUIS** (Mo.). Founded in 1848 by four sisters from Oedenburg, Austria, incorporated in Missouri in 1884. It is one of the oldest houses of the order in the United States. They opened the school 2 Nov. 1848, in a small house on Fifth street. In 1849 they were reinforced by six sisters from Landshut, Bavaria, and also received considerable pecuniary assistance from the Bavarian king, Louis I. Early in 1850 the city block bounded by 11th and 12th streets and Russell and Ann avenues, was purchased for them by Archbishop Kenrick, and extensive buildings — convent, academy, day school — mark this their present location, whence band after band has since gone forth to found houses in other localities. In 1855 a colony of 12 set out for New York and established a house of the order at East Morrisania, N. Y. In 1859, in answer to an appeal from Bishop Juncker, seven sisters left the mother house to open a school at Alton, Ill. In 1877 another band went forth to plant the standard of education in the beautiful valley of Arcadia, Mo. Here they established an academy that bids fair to equal the one in Saint Louis in course of time. The Saint Louis community now numbers 160 members, and besides the flourishing academy and day-school connected with the mother house, the community supplies 16 parochial schools with teachers. These schools aggregate about 1,500 pupils — thus bearing out the motto of the institute: "*Mores Scientiaque.*"

URSULINE SISTERS. See ORDERS, RELIGIOUS.

URTICACEÆ, or NETTLEWORTS. See NETTLE.

URTICARIA, an inflammatory eruptive affection of the skin, also called hives and nettle-rash, the latter name referring to the resemblance of the wheals or rounded elevations of cuticle to those caused by the sting of a nettle. The wheals are either rounded or elongated, appearing white at first, and afterward changing to red, the altered hue being more quickly assumed in consequence of rubbing or scratching to which the intense itching usually leads. Frequently urticaria follows upon gastric disturbance caused by eating certain fruits, shell-fish, or other foods that disagrees with the stomach fluids. It may also be due to disorders of menstruation, to various functional irregularities, or to local irritations. Some of the balsamic drugs likewise give rise to it. The eruption appears and disappears suddenly in successive crops of wheals. In treatment it is necessary to evacuate the bowels and regulate the diet so as to restore the normal digestive condition, and cold-cream, glycerine, dilute acids, bichloride of mercury, etc., are useful, locally. Salt-water baths are recommended for relief of the itching. For internal remedies salicylates and alkalies are administered, and by this means the severity of an attack may often be abated and its duration lessened.

URUGUAY. (República Oriental del Uruguay), smallest of the independent countries of South America, bounded on the north and northeast by Brazil, on the east by the Atlantic Ocean, on the southeast and south by the Atlantic Ocean and the estuary of the Rio de la Plata, and on the west by the Argentine Republic. Its territory extends from lat. 30° S. nearly to lat. 35° S., and the location of its principal city (or, more precisely, of the cathedral at Montevideo) is given as lat. 34° 54′ 33″ S., and long. 58° 32′ 32″ W. Total area of the republic, 72,210 square miles (about 7,210 square miles more than the total area of New England).

Topography.— The most elevated point in the republic is somewhat less than 2,000 feet above sea-level; the so-called mountains are, therefore, to be regarded rather as hills, which sometimes form chains — such as the Cuchilla Grande, which extends across the country, the Santa Ana range, between Brazil and Uruguay, the Cuchilla de Belén, and Cuchilla de Haedo, — but elsewhere give to the region, especially the northern districts, an irregular rolling or undulating surface. Forests or groves cover the hills in the north and generally extend along the banks of the numerous small streams (*arroyos*) and the larger water courses. The soil in the southwest is of uncommon fertility, being composed of detritus of great depth and rich alluvial deposits; the southeast and south have grassy slopes and good pasture lands, the hills here forming a bold line along the shore of the Rio de la Plata, but not extending to the Atlantic Coast. Important rivers, besides the great southern estuary, are the Uruguay, which rises in the Brazilian state of Santa Catharina, and has a course of about 1,000 miles; and the Rio Negro, which also rises in Brazil, and empties into the Uruguay after flowing toward the southwest for about 350 miles. The latter passes through the centre of the republic; the former marks the boundary with Argentina; both are navigable for vessels of light draught (Rio Negro 55 miles, Uruguay 200 miles), and even large steamships navigate the Uruguay up to Paysandú. There are several shallow lakes, or *lagunas*, near the eastern coast. The largest of these. Lake Merín (or Mirim), about 108 miles long by 14 miles wide, partly in Uruguay and partly in Brazil, is only of sufficient depth for navigation by the light-draught steamers that maintain communication between the towns on its shores.

Climate.— The southern part of Uruguay has a remarkably pleasant, temperate and healthful climate, resembling, and in evenness throughout the year outclassing, that of the Riviera of southern France and the northwest

of Italy. Extremes of heat and cold are unknown in that part of the country most subject to the climatic influence of the ocean and the great estuary. Naturally, such extremes are more marked in the northern inland regions, where the lowlands in summer are decidedly hot, the thermometer sometimes recording 100° F. The cold season brings frost or snow infrequently to the uplands. Taking the country as a whole, we note as unfavorable phenomena the storm-winds called *pamperos* and hailstorms that too often injure the standing crops. The average annual rainfall is about 37.19 inches; the average annual temperature, 62° F. or 63° F., approximately; the mean temperature of winter about 55° F., and of summer between 72° F. and 73° F.

Fauna and Flora.— The indigenous animal kingdom, although it includes 30 species of mammals, has only a few really notable representatives. "Those of most commercial value are the rhea, or American ostrich, and the fur-seal. Both of these, until recently, were found in large numbers, but, owing to the systematic pursuit of the rhea and the indiscriminate killing of the seal, both were threatened with extinction, until the government took measures to insure their preservation and increase. One may have some idea of the vast number of ostriches that roamed the plains of Uruguay in 1909 from the fact that, during that year, more than 50,000 pounds of ostrich feathers were exported to the United States and Europe." (Consult Zahm, J. A., *Through South America's Southland,* New York and London 1916). The seals in large numbers live and breed on the islands near the coast, especially the Lobos and Castillos groups. More than three-fifths of the seals at these rookeries are of the fur-bearing variety, and the islands are now strictly preserved, no one being permitted to land upon them except the sealers during the killing month. The number annually slaughtered for their oil and skins has ranged between 10,000 and 21,000 or 22,000. The mainland fauna includes the deer, otter, wild hog, carpincho, fox, ounce, wildcat, ant-eater, etc. There are over 500 species of avifauna, including the crane, stork, swan and wild turkey. In the work cited above, Dr. Zahm writes that, while traversing the rich, undulating plains of Uruguay, "everywhere, within the field of view, there was a wealth of verdure and bloom that rendered the landscape as exquisite as a picture by a master"— the most conspicuous among flowers being the *flor morala* "which carpets the landscape with glowing bands and patches of richest purple. Go where one will, one finds massed banks of the blazing *flor morala* — flowers that grow in such profusion that they extinguish all competitors. Small wonder, then, is it that Uruguay has been called 'The Purple Land.'" The area of forests is relatively small — only about 1,650,000 acres. Their hard and durable woods are: The ñandubay (which, instead of decaying when buried in the earth, becomes petrified), urunday, lapacho, coronilla, espinello, quebracho, arazá, algarroba and lignum vitæ. Among the softer woods are the willow and acacia. Native palms abound in the departments of Maldonado, Minas, Paysandú and in valleys of the central and northern districts, and the poplar, pine, cypress, oak, eucalyptus, cedar, magnolia and mulberry have been successfully acclimated. Yerba maté is indigenous and 430 species of medicinal plants have been classified.

Mineral Resources.— The only mines that have been worked continuously for many years are the gold mines at Cuñapirú, in the Department of Rivera, in the northern part of the republic. Work began there in 1869. The ore occurs in quartz veins intersecting dioritic rocks. In that part of Uruguay the mineralized territory is extensive. Another auriferous zone is found near Soldado, in the Department of Minas, where both gold and copper have been extracted from pyritiferous and cupriferous formations. Copper has been found also in the Department of Maldonado. A large iron-manganese deposit, containing about 35 per cent iron and 23 per cent manganese, exists in the Department of Rivera, near the gold mines, and there are other deposits of iron and manganese ore at Carrasco. Talc of excellent quality is mined at Las Conchillas, in the Department of Colonia, near the estuary of La Plata. Along this southern coast, especially in the departments of Colonia and Maldonado, the granite quarries command attention, and in the republic generally the quarrying industry is very important. (Consult Marstrander, R., *Engineering and Mining Journal,* 13 March 1915). Coal and petroleum have been found recently, the former in the departments of Montevideo, Cerro Largo and Santa Lucia.

History.— On 8 Oct. 1515 Juan Diaz de Solis sailed from Spain; he explored the estuary of the Rio de la Plata and was slain, with some of his companions, by natives of the Charrua tribe. On 2 Feb. 1520 Magellan sailed from the Rio de la Plata, after having explored to a limited extent the Paraná and Uruguay rivers in his search for a waterway across Terra Firma. On 1 April 1526 Sebastian Cabot set out from Seville; he ascended the Paraná to the great falls and the Paraguay to the mouth of the Bermejo. In 1527 Cabot ordered the construction of a fort in the country east of the Uruguay River. The opposition of the natives to the Spanish settlements was fierce and, during a century, successful: in 1603 a veteran Spanish force was routed in a pitched battle by the Charruas. In 1624 the oldest of the towns which now exist in Uruguay was founded on Rio Negro. The so-called "Banda Oriental" (that is to say, the region east of the Uruguay River) was the subject of contention between Portugal and Spain. In 1680 the Portuguese colonists of Brazil founded Sacramento (now Colonia), thus confronting the Spaniards at Buenos Aires. In 1723 the Portuguese fortified the Bay of Montevideo, but surrendered to the Spaniards in the following year, and families from Buenos Aires established themselves at Montevideo in 1726. In 1735–37 Colonia was besieged by the Spaniards. In 1761 it capitulated, but was restored to Portugal by the Treaty of Paris 1763. This did not put an end to Spanish colonization there; on the contrary, immigration from the north of Spain and from Spanish settlements across the river continued throughout the 18th century. On 26 April and 28 May 1811 José Artigas, leader of the Revolutionary party in the Banda Oriental, routed the Spanish forces;

a confederation of the settlements east of the great river was formed, with Artigas as Protector. But the Portuguese captured Montevideo and Maldonado, and in 1822 the region in dispute was organized as the Cisplatine Province of Brazil. Artigas took refuge in Paraguay, where he died; but his gallant, patriotic efforts had not been wasted. Other refugees, who had gone to Buenos Aires, returned to start a rebellion in the Cisplatine province, and on 23 Aug. 1825 issued a declaration of independence. On 24 September and 12 October in the same year the Brazilians were defeated. Then the Argentine government intervened. On 9 February and 30 July 1826 Admiral Brown, commanding the Argentine squadron, failed in his attempts upon the Brazilian fleet; but in February 1827 succeeded in destroying the expedition sent by the Brazilian admiral, Lobo, into the Uruguay River, and on the 20th of that month the Marquis of Barbaceno, commanding Brazilian forces, was defeated at Ituzaningo. On 27 Aug. 1828 the Treaty of Montevideo was signed, and the República Oriental del Uruguay was created, both Brazil and Argentina renouncing their claims to the country thenceforth to be known as the Eastern Republic of the Uruguay, or simply Uruguay. On 18 July 1830 the constitution was adopted and a new declaration of independence issued — this time guaranteed by both of the strong neighboring states. But, unfortunately, the political parties — the "Colorados," or Reds, and "Blancos," or Whites — kept alive the traditions of home-bred strife. Thus, in 1842, a political chief secured Argentine support and laid siege to Montevideo; in 1862 ex-President Flores, "Colorado" leader, made use of Brazilian troops to take Paysandú. On 25 Feb. 1865 Flores with his Brazilian allies took forcible possession of the capital and of the government; quite naturally, therefore, Uruguay was drawn into the coalition formed to resist the dictator of Paraguay, Francisco Lopez. On 17 Aug. 1865 Flores defeated a division of Paraguayans at Yatay; three years later he was assassinated during a "Blanco" rebellion at Montevideo, and ex-President Ferro, "who, though not one of the assassins, was arrested in the street with arms in his hands," was executed, with other rioters. The revolution of 1870–73 ended in a "Colorado" triumph. Of the long series of disturbances which have followed, marking the efforts of "Blancos" to regain power, only one need be mentioned at present — the serious revolution which broke out in March 1903 and continued in 1904 despite the increased military force of the government. Gradually the substantially prosperous republic has outgrown and subordinated lawless political factions; gradually the habitual uprisings against the established government have become less formidable, losing the revolutionary character and appearing rather as mere provincial riots.

In December 1908 a Supreme Court was established and the judicial system was reorganized. The Montevideo Port Railway was inaugurated on 16 May 1913. Dr. Feliciano Viera was elected on 1 March 1915 as President of Uruguay (and inaugurated two days later) for the term ending 1 March 1919.

Government.— According to the provisions of the constitution of 18 July 1830, the legislative branch of the government is composed of the Senate and the House of Representatives, the former having one member for each of the 19 political divisions, called departments, and the latter one for each 3,000 inhabitants or fraction exceeding 2,000. Together they compose the General Assembly, in which all legislative power is vested, and they meet annually from 15 February to 15 June. The term of a senator is six years and that of a deputy is three. In many respects the powers of this Congress or General Assembly are similar to those of the Congress of the United States, but they extend much farther in certain directions, namely, to the granting of pardons and amnesties in extraordinary cases and electing the President of the republic (see below). The judicial power is exercised in several courts of first instance (distributed as civil, criminal, for cases affecting the treasury, for commercial cases, police and departmental); courts of appeal and the High Court of Justice. The executive power is vested in a President, who is chosen for a term of four years by a majority of the members of the legislature in joint session of its two chambers. The President is ineligible for the term immediately following his tenure of office. He is aided by a cabinet of seven ministers, who, although appointed by him, are responsible to the Congress as well. The law of 3 March 1911, increasing the number of cabinet officers from five to seven, established the following ministries: Interior and Worship; Foreign Affairs; Finance; Justice and Public Instruction; Industries, Labor and Communications; Public Works; War and Marine. Reform of the fundamental law is part of the order of the day. A new Constitution, to come into force 1 March 1919, was adopted by the two great political parties in 1917. Its basic principles are the following: (1) The next President is to be elected by the Chambers — The Senate and House of Representatives — as heretofore, but succeeding Presidents are to be elected directly by the people, with secret voting. The Presidential period will remain as at present, a four-year period. (2) No one can be re-elected as President until eight years shall have elapsed after his previous term. This is substituted for the provision that he must not be a candidate for re-election for the term immediately following his own tenure of office. (3) In case of vacancy occurring in the presidency, the Chambers, by absolute majority, shall at once elect a substitute to hold office for the remainder of the period. The provision has been heretofore that in case of the President's disability or death, the presiding officer of the Senate shall assume the presidency. (4) The President shall have direction of the army and navy, and shall be in charge of foreign affairs and of public order at home and abroad. The prefects shall be dependent upon him alone; nevertheless it is provided that they shall be appointed by him from candidates proposed by an important body to be known as the Council or the Council of State. (5) The Council shall submit for examination by the President matters relating to the creation or modification of taxes, to loans, to the budget, the circulating medium and to foreign commerce. This includes also practically all proposed economic measures. If the President

withhold his approval the Council may prevail only by a two-thirds vote. (6) Conflicts of jurisdiction between the President and the Council of State shall be decided by the Chambers. (7) The Council of State shall consist of nine members, serving six years each; it shall be renewed by third parts, every two years, by direct election and secret voting. The first Council shall be elected by the Chambers, six members by the majority and three by the minority. (8) The Chambers shall be paramount in their control of national measures. (9) The principle of municipal autonomy with the enjoyment of suitable revenues is adopted. (10) Constitutional reforms may be initiated by either of the Chambers, proposed amendments requiring a two-thirds vote of the total membership of each Chamber for acceptance. The amendments shall be submitted to the succeeding legislature; and if then approved in the same form and manner their ratification shall be considered complete. (11) All forms of worship are free in Uruguay. The State does not sustain any religion. It recognizes the proprietorship of the Catholic Church in ecclesiastical edifices already built in whole or in part by national funds, except the chapels attached to asylums, hospitals, prisons and other public establishments. Churches and other places of worship are free from all taxation. (12) Inscription in the civil register is obligatory; in all elections, whether of national or of municipal officers, taking place after 1 March 1919 the voting shall be secret and representation shall be proportional; very positive restrictions are imposed upon military and police functionaries in respect to political activity, etc. The political parties, Colorados and Blancos, after conciliatory negotiations, agreed to accept what has been characterized as a "modern, smooth-running, efficient mechanism of State" in place of the old constitution which, according to the best opinion of the progressive element and financial authorities, was unsuited to present-day conditions.

Education and Religion.— This republic is spending about $5,000,000 a year for the maintenance and development of the educational system. Primary education is compulsory, and there has been little or no occasion for inflicting penalties for violations of the law in regard to this matter, since applications for admission to the schools are generally far in excess of the school accommodations. There were in 1917 1,203 elementary schools with an attendance of 120,000 pupils, approximately, the enrolment of pupils having increased 23 per cent between 1908 and 1913 (from 60,683 to 91,746) and at a slower rate between 1913 and 1917. There are also 203 private schools with 19,768 pupils. The number of rural schools has nearly doubled since 1906, in which year the sum of $1,000,000 was appropriated for the erection and improvement of school buildings. A recent report of the Minister of Public Instruction contains the statements: Mixed schools have been established "in almost all the rural districts which have a sufficient number of children of both sexes to average an attendance of not less than 30 pupils"; and "Since the permanence of pupils in rural schools never exceeds three years, a simple program has been outlined which can be developed in that short period, so that when the pupil leaves school he knows how to read and write and to perform the principal arithmetical operations; has some acquaintance with geography, history and the constitution of the republic; and [this being one of the good traditions of South American schools] has been impressed with notions of the purest morality." All schools in the republic receive frequent visits from inspectors who report directly to the minister of public instruction, and these visits are supplemented by medical inspections. A law of 1907 authorized the establishment of schools for adults, the object being to overcome such illiteracy as had been the natural result of the scarcity of rural schools up to that time. About 50 evening schools have accordingly been established at different centres, and these are attended by 2,600 pupils. The department of Rocha leads in the practical teaching of agriculture, and the same department has also established a higher commercial school. At Montevideo we find the university one of the modern organizations of this class, and of high distinction, with faculties of law, science, medicine, mathematics, agriculture and commerce; secondary schools; special institutions, such as the National Institute for the Deaf and Dumb, established in 1910; and two excellent normal schools, one for boys and the other for girls. State pupils at these normal schools enjoy a pension of $15 a month as a contribution assisting them to meet the expenses of residence at the capital. The provision made for supplying textbooks or pedagogical works gratuitously, under certain conditions, may also be mentioned as another example of wise liberality. The High School of Commerce of Uruguay, in its three-year course — which may be extended to four years — gives instruction in bookkeeping, accounts, geography, political economy, languages (particularly the English language) and stenography.

The cabinet officer known as Minister of the Interior and Worship has authority in relation to the welfare of the clergy of the Apostolic Roman Catholic Church and under the constitution Roman Catholicism is the state religion; there is, however, complete toleration, and about one-third of the adult population should be classified as Protestants, Liberals, etc.

The Judicature.— The judicial system of the republic was reorganized in 1907. It now includes a High Court of five justices, the latter being chosen by the general assembly of the chambers, and the presiding officer of the court being chosen for one year by the members themselves. This High Court has original jurisdiction in constitutional, international and admiralty cases, and hears appeals in cases in which the decision has been altered in the minor courts of appeal, of which there are two, each with three justices. Montevideo has three courts for ordinary civil cases, two for commercial cases, one for government cases, two for criminal cases, one correctional court and three for criminal investigation. At each department capital there is located a departmental court and there are 214 judicial sections in the republic, each with a justice of the peace court. Lesser local divisions are known as districts in which deputy judges have a limited jurisdiction. The death penalty was abolished

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1 Plaza and Harbor of Montevideo

2 University of Montevidec

in 1907, penal servitude for 30 to 40 years being substituted.

Agricultural and Pastoral Industries.—Although the soil is fertile and the climate favorable to agriculture, less than 4 per cent of the country is under cultivation (in 1916 about 2,000,000 acres out of a total of more than 45,000,000 acres). Uruguay is still, despite the efforts that have been made by the government to extend the cultivated area, essentially a pastoral country, 41,350,000 acres being devoted to sheep, cattle, etc. The chief agricultural products are: Wheat (average crop 360,000, tons); Indian corn (average crop 200,000 tons); linseed (average crop 27,000 tons); oats (average crop 27,000 tons); wine (average annual production 34,000 tons); tobacco (average crop 1,000 tons).

The staple products of Uruguay are meats, hides and wool. A livestock census which was provided for by a government decree in January 1917 shows the different classes of cattle in each department of Uruguay, but in submitting the figures the director of the census states that they are to be considered as only partial statistics. The total number of cattle in the whole country is given as 7,942,212, the largest number in any department, 711,224, being in Tacuarembo, and the smallest number, 26,373, in the Department of Montevideo. Each of the departments of Artigas, Cerro Largo, Durazno and Salto has more than 600,000 cattle; Paysandú and Rio Negro are in the 500,000 class; Florida, Minas, Rivera, Rocha and Soriano show over 400,000 each, while the remaining departments have in the neighborhood of 200,000 or 300,000 each. The taking of this cattle census is only one of various measures which the government of Uruguay is adopting for the development of its livestock industry, the chief source of the country's wealth. The stock of sheep was estimated in 1916 as about 27,000,000; hogs, over 500,000; horses (statistics of 1917), 560,000. Livestock statistics are prepared, primarily, by the animal sanitary police, a well-organized force empowered to treat, to quarantine or to destroy diseased animals. The value of wool sheared each year is given as $25,000,000. Favorable conditions of climate and pasturage, together with intelligent methods of propagation, have induced that steady increase of the flocks of sheep which has made the Uruguayan wool-clip such an important matter. As statistics show, the sheep to-day may be divided into two classes—Spanish and British, omitting the Asiatic breed. The finest sheep in the world came originally from Spain, and the authorities of Uruguay have not only bestowed great care upon the selection and development of types that thrive best under local conditions, but also have spared no expense in their search for the finest varieties developed in other lands. The value of the slaughtered livestock of all classes was shown in statistics submitted to the First Pan-American Financial Conference to be less than the value of the "wool crop"—about $22,000,000 as compared with $25,000,000. But in 1915 when the total value of exports of the grazing and meat industry increased nearly 50 per cent, wool exports showed no corresponding gain. An important product of the livestock industry is *tasajo* (jerked beef), chiefly exported to Brazil, Cuba and Porto Rico. In 1914 more than 11,000 tons of *tasajo* were shipped from Uruguay to other countries, but in 1915 only 5,334 tons.

Commerce and Manufacturing Industries.—The value of Uruguay's imports from all countries in 1915 was $36,378,925, and of her exports to all countries, $76,222,298. The value of her imports from the United States in the same year was $7,519,654, and of her exports to the United States, $12,148,464. In 1916 the six countries leading in exports to Uruguay were, in the order of total value of such exports: United States (which exported to Uruguay, increasingly large quantities of agricultural implements, binder twine, cotton cloths, railway material, and miscellaneous manufactures of iron and steel), Argentina, Great Britain, Brazil, Spain and Italy. The six countries leading in imports from Uruguay in 1916 were, in the order of total value of such imports: Italy, United States, France, Argentina, Great Britain and Spain. In 1917 the imports amounted to $37,500,000 and the exports to $67,516,275. The exports were principally livestock, $2,311,190; canned goods and extracts, $26,567,006 and wool, $18,601,275. The following tables show at a glance the chief groups of articles imported and exported:

IMPORTS BY GROUPS OF ARTICLES.

Sept., 1915, to Feb., 1916, inclusive.

	Pesos
Groceries, etc.	5,224,587
Drygoods and notions	2,123,021
Iron manufactures, stationery, ships' stores and jewelry	2,200,401
Electrical supplies	42,278
Musical instruments	27,589
Furniture and upholstery	51,649
Shoemakers' wares, saddlery, and skins	124,311
Building materials, etc.	1,843,327
Drugs and chemical products	101,229
Pharmaceutical specialties and druggists' sundries	112,691
Perfumery	51,123
Inflammables	1,102,546
Live animals	2,462,404
Primary materials	2,106,348
Non-dutiable articles	810,832
Miscellaneous	158,841
Total	18,453,177
Value in currency of the United States	$19,191,304

EXPORTS BY GROUPS OF ARTICLES.

According to the Boletín del Ministerio de Hacienda, the exports by groups of articles for the years 1914 and 1915 were as follows:

	1914 Pesos	1915 Pesos
Grazing and meat industry, including wool	48,014,263	70,535,539
Agriculture	1,351,190	753,166
Mine products	2,525,573	1,109,825
Fishing and hunting	157,234	90,463
Miscellaneous products	99,248	561,412
Ships' supplies	271,294	240,266
Total	52,418,802	73,290,671
Value in currency of the United States	$54,515,554	$76,222,298

The foreign trade of Uruguay has been studied with a view to ascertaining also the percentage of each of the main divisions of the imports and exports. The result appears in the following table, which shows the average of recent years, thus minimizing the effects of

such exceptional conditions as the war has created:

IMPORTS.

	Per cent.
Foodstuffs	19.02
Textiles and manufactures of	18.77
Iron, steel, and products of	11.04
Stone, earth, glass, etc	11.10
Lumber and woods	8.15
Metals, not including iron	8.15
Industrial oils	3.12
Drugs	2.24
Livestock	1.94
Other products	22.28

EXPORTS.

Livestock products	90.24
Agricultural products	4.23
Mineral products	4.60
Game and fishing products	.46
Ship provisions	.47

Uruguay's chief exports to the United States are leathers, meat products and wool. Her principal imports from the United States are passenger automobiles, cotton cloth, drugs and chemicals, flour, hardware and tools, knit goods, iron and steel, lubricating oil, rosin, sugar and tinplate.

The manufacturing industries of Uruguay are on a small scale as a rule, but a noteworthy exception is the immense establishment of the Liebig Company at Fray Bentos. In Montevideo there are flour mills and boot and shoe factories. Several woolen-mills, brick and tile works and glass and bottle factories are in operation. Other manufactures are: Furniture, cotton and linen cloth, cement, etc.

Money, Banking and Finance.— Uruguay's monetary system is based on the gold standard, the theoretical unit being the Uruguayan gold peso, divided into 100 centesimos and representing 1.697 grammes of gold .917 fine or say 1.5561 grammes of pure gold. Its par value in terms of the currency of the United States is $1.0342 and the par value of $1, currency of the United States, in terms of Uruguayan currency is $0.96689 pesos. But, inasmuch as Uruguay has never actually coined the peso or other gold-piece, the circulation consists of banknotes and foreign gold coins, which are legal tender at the following rates:

United States	Eagle	$9	66 pesos
English	Sovereign	4	70 "
German	20 marks	4	60 "
French	20 francs	3	73 "
Belgium	20 francs	3	73 "
Italy	20 lire	3	73 "
Spanish	Doblon	4	82 "
Brazil	20 milreis	10	56 "
Argentine	$5 00 pesos	4	66 "

Exchange rates are quoted normally in Montevideo as follows:

London	90 d/s	51 11/16d	= $1 00	pesos
London	Sight	50 1/4d	= 1 00	"
Paris	90 d/s francs	5 42½	= 1 00	"
Paris	Sight francs	5 36½	= 1 00	"
Berlin	90 d/s marks	4 41	= 1 00	"
Berlin	Sight marks	4 34	= 1 00	"
New York	Sight U. S. cy.	$1 00	= 0.973	"

The principal banks in Montevideo are: Banco de la Republica, Banco Popular del Uruguay, Banco Comercial, Banco Español, Banco Francés, Banco Alemán Transatlántico, Banco Británico de la América del Sud, Banco Anglo Sud-Americano, Banco de Londres y Río de la Plata, London and Brazilian Bank, Limited, and a branch of the National City Bank of New York. The first mentioned is really a state institution, its capital having been contributed solely by the government. It is administered by directors who, although appointed by the President of the republic with the consent of the Senate, enjoy complete independence. In this connection we quote the observations of the Uruguayan delegation to the First Pan-American Financial Conference: "Its employees are selected among the most able men, after having passed certain examinations, and the principal officials of the country, including the First Magistrate himself, take pride in not interfering with the independence of the bank, and they do their utmost to help increase its resources and credit. This bank, which to-day exercises a vital influence in the economy of the country by stimulating industries and trade, has 24 branches and agencies distributed among the principal cities and towns of the interior, and consequently can claim from an international point of view the financial representation of the republic. In the near future the bank will be in a position to extend its field of operations to North, Central, and South America, establishing there also agencies and branches, for its capital is rapidly increasing by means of accumulated profits."

The budget for the fiscal year 1916–17 estimated expenses at $30,525,402.64 and receipts $29,452,776.55. For 1915–16 the figures were: $29,477,311.81 for expenses, including interest on public debts, and $29,578,000 for revenue, the chief sources of revenue, under the conditions created by the war, having been:

Customs duties	*$12,500,000
Taxes on real estate	4,400,000
Commercial licenses	1,700,000
Taxes on cigars and tobacco	1,250,000
Special duties for public education	960,000
Post office and telegraph	700,000
Taxes on alcohol	805,000
Taxes on matches	320,000
Taxes on beer	190,000
Taxes on brandy	80,000
Taxes on sugar	260,000
Taxes on wines	280,000
Export duties on livestock	480,000
Revenue stamped paper	580,000
Stamps	360,000
Consular fees	360,000

* Custom duties yielded $17,500,000 in 1913–14.

The revenue and expenditure for the fiscal year 1917–18 were:

Revenue		Expenditure	
Customs	$12,250,000	Legislature	$713,382
Property tax	4,160,000	Presidency	69,244
Trade licenses	1,600,000	Ministry	
Factory and tobacco taxes	1,200,000	Foreign Affairs	511,735
Stamped paper and stamps	900,000	Interior	3,299,417
Surtaxes on imports and exports	620,000	Finance	2,142,394
Other receipts	8,721,428	Industries	876,752
		Public Works	1,324,586
		War and Marine	5,187,850
		Public instruction	3,323,410
		Justice	389,640
		National obligation	11,683,356
Total	$29,451,428	Total	$29,521,666

As contributors to revenue we mention the following government institutions: The Bank of the Republic, the Mortgage Bank, the Insurance State Bank and the electric-light and power plants, capitalized with the proceeds of

a $4,500,000 loan and constituting a state monopoly.

The public debts are: The consolidated debt, originating in a loan of £19,570,000 at 3½ per cent interest and 1 per cent sinking fund (the distribution of the securities being, in 1915, in Europe 69.73 per cent and in Uruguay 30.27 per cent); the conversion loan taken by the Banque de Paris et des Pays Bas at 90 per cent net and sold to the public at 97 per cent, of which loan the holdings in Europe amount to 70.74 per cent, and in Uruguay 29.26 per cent; the guaranty debt, 4 per cent (practically redeemed through purchase by the state of the Mortgage Bank which had these securities as part of its capital); the unified interior debt, 4 per cent, $1,448,650 ($1,100,000 held in London and the balance in Uruguay); the Insurance State Bank loan, 5 per cent (the whole amount, $3,000,000, belonging to the state, "as the bank never felt the necessity of selling bonds"); the 1915 interior debt loan, $6,000,000, issued at 8 per cent. In 1917 the Uruguayan government proceeded to the conversion of the last-mentioned loan (8 per cent) into a new conversion loan at 6½ per cent, with a bonus of 5 per cent.

Transportation and Communication.— The railroads in Uruguay radiate westward and northward from Montevideo, three lines connecting the country with Brazil. They are in the main of standard gauge; their total length in 1919 was about 1,600 miles, and they carry annually about 1,800,000 passengers and 1,700,000 tons of freight. Plans have been made for extending the system by the addition of 1,500 miles of track. The length of tramway lines in operation is about 170 miles; the total length of departmental wagons roads or bridle paths more than 3,000 miles, and of national highways about 2,240 miles. Efforts are being made to put the highways in better condition for motor traffic. The river system is extensive and of great value for transportation, all of the following ports on the Uruguay River admitting vessels of nine (and some even of 14) feet draft: Carmelo, Neuva Palmira, Soriano, Fray Bentos, Nuevo Berlin, Casa Blanca, Paysandú, Salto and Santa Rosa. On the Rio Negro the chief port is Mercedes; on the San Salvador River, the port of San Salvador, and small craft reach the interior on a dozen or more of the Uruguay's tributary streams. Steamship communication between Uruguay and foreign lands is maintained by transatlantic lines representing the chief nations of western Europe. Between Montevideo and New York there is a weekly service; local transportation lines keep the Uruguayan coast in touch with the Atlantic ports of Brazil or the river ports of Paraguay, and there is a regular nightly steamship service between Montevideo and Buenos Aires. The clearances at Uruguayan ports reaches annually about 8,000,000 tons. Uruguay possesses 27 steamers of a total tonnage of 20,298 tons.

Uruguay has extended its wireless service by establishing a large station at Montevideo, with a range of 621 miles, and other stations identified with the War and Marine Ministry or Department. The number of post offices in the country is about 1,200; of telegraph and telephone stations, about 60. Telephone lines have 16,518 miles of wire.

Weights and Measures.—The metric system has been adopted officially and gains ground steadily among the people in the chief centres of population, displacing such antiquated units as the libra (1.0143 pounds); arroba (25.35 pounds); quintal (101.4 pounds); cuadra (1.8 acres); fanega (30 gallons), etc. The recognized basis of thorough reform in this respect is practical demonstration of the greater convenience of the new system.

Army and Navy.—The strength of the army at present is given as slightly more than 10,000 — 600 officers and about 10,200 men — and about 100,000 men receive training in the national guard. For the navy, additional ships are being constructed. The number of vessels in 1916 was 12, with 60 officers and 600 men.

Population, Political Divisions, etc.— The number of inhabitants is estimated at 1,406,000. In the northern part of the republic there are many Brazilians, who cross the border from the state of Rio Grande do Sul; otherwise the population consists principally of Spaniards or people of Spanish descent (the most numerous class), of Italian colonists and citizens and of the English, Swiss and German residents who are actively engaged in business, banking or agriculture.

The Oriental republic of Uruguay is divided into 19 departments, which with their areas, populations and capitals are as follows:

DEPARTMENTS	Area (square miles)	Population	Capital	Population
Artigas	4,394	37,350	San Eugenio	10,000
Canelones	1,834	112,092	Guadalupe	10,000
Cerro Largo	5,763	56,272	Villa de Melo	4,000
Colonia	2,193	80,275	Colonia	15,000
Durazno	5,525	53,785	Durazno	11,000
Flores	1,744	22,630	Trinidad	4,000
Florida	4,673	59,916	Florida	10,000
Maldonado	1,587	38,955	Maldonado	11,000
Minas	4,819	65,893	Minas	8,995
Montevideo	256	373,964	Montevideo	376,163
Paysandú	5,115	65,915	Paysandú	22,000
Rio Negro	3,269	35,714	Fray Bentos	12,000
Rivera	3,793	44,824	Rivera	8,000
Rocha	4,280	45,369	Rocha	5,000
Salto	4,865	74,415	Salto	19,788
San José	2,688	59,533	San José	13,000
Soriano	3,560	54,018	Mercedes	15,000
Tacuarembo	8,112	58,708	San Fructuosa	9,000
Treinta y Tres	3,682	39,180	Treinta y Tres	10,000
Total	72,153	1,378,808		

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URUGUAY, a river of South America, rising on the coast range of southern Brazil, flowing west on the boundary between the states of Santa Catharina and Rio Grande do Sul, then southwest between the latter state and Argentina and finally south between Argentina and the republic of Uruguay, emptying into the head of the estuary of La Plata. Its main head stream in Brazil is called the Pelotas. It is over 1,200 miles long and an important avenue of commerce, passing the towns of Salto, Paysandú and Concepción. It is very broad for 100 miles from its entrance to the gulf styled Rio de la Plata and is navigable for the large steamers to Paysandú, and for smaller vessels to the rapids above Salto, above which it can again be navigated for several hundred miles.

URUMCHI, oo-room'chē, or **TIHUAFU,** central Asia, a city of Chinese Sungaria, in the province Sin-kiang, on the northern side of the Tyan-Shan Mountains. It consists of an old and a new town, the former being situated on the slope of a mountain which attains a height of 14,000 feet above sea-level. It was formerly of great commercial importance in the trade between Russia, Turkestan and India. Urumchi is of strategic importance and is now the administrative and military capital of the province of Sin-kiang. Pop. estimated at 25,000.

URUMIA, oo-roo-mē'ä, **URUMIAH,** or **URUMIYAH,** Persia, (1) a town in the west of the province of Azerbijan, situated on an extensive plain about 10 miles west of Lake Urumia and 65 miles southwest of Tabriz. It claims to be the birthplace of Zoroaster, and in the vicinity are several mounds, supposed to have been made use of in the ceremonies of the ancient fire-worshippers. It has two colleges and a seminary and is the see of a Latin bishop. The surrounding district is of great fertility, covered with groves, orchards, vineyards, gardens, rice-grounds and villages. Pop. about 30,000. It was the scene of an Armenian massacre by the Turks in 1915. (2) The lake, situated 4,300 feet above sea-level, is about 80 miles long from north to south, by 20 miles broad and has no apparent outlet. It is very shallow throughout. Numerous islands are scattered over its surface. Its waters are so salt that neither fish nor mollusca can live in it. Salt of a good commercial quality is obtained from shore deposits, the result of natural evaporation.

URUS, an extinct wild ox (*Bos urus*) that roamed in Gaul and other European countries at the period of the Roman invasion, as described by Cæsar. See Ox; WHITE CATTLE.

USAGE, in law. See COMMON LAW.

USAMBARA, oo-zäm-bä'rä, German East Africa, a mountainous district in the northeast part of the colony, bordering on the coast northwest of Zanzibar. It is extremely fertile and one of the most important parts of the colony.

USBEGS, or **USBECKS.** See TUAREGS.

USE, *in English law,* the permanent equitable right, benefit or profit of lands and tenements that are in the possession of a person who simply holds them for another person, the real beneficiary. He to whose *use* or benefit the trust is intended enjoys the profits and is called *cestui que use.* All modern conveyances are directly or indirectly founded on the doctrine of uses and trusts, which has been deemed the most intricate part of the property law of England.

USE AND DISUSE, one of the doctrines in that view of organic evolution promulgated by Lamarck (q.v.) which holds that variations in structure are brought about by the use, in the one case, or by the disuse in another, of organs. Conceding that physical changes due to such a cause may be brought about in the individual, the important question remains—are they inheritable? Hence, a correlated part of the theory must be disposed of under the name "use-inheritance." Followers of Lamarck are believers in the efficacy of use and disuse and use-inheritance as factors in evolution. Others cite the evidence that head-flattening practised by various uncivilized tribes has no hereditary result, neither tattooing. Consult the writings of Lamarck, Packard, Cope, Hyatt, Weissmann, etc. See EVOLUTION, HISTORY OF; HEREDITY; LAMARCKISM.

USEDOM, oo'zĕ dōm, Prussia, one of the two islands which separate the Stettiner Haff from the Baltic Sea, six miles southeast of Rügen. It is of irregular shape, 34 miles long, and ¼ to 15 miles wide. Agriculture, cattle-raising and fishing are the chief occupations. The chief town is Swinemünde. Pop. about 30,000.

USERTESEN, or **USERTEN** (known to the Greeks as SESORTOSIS), the name of several Egyptian kings of the ancient royal house of Thebes. They belonged to the 12th dynasty and reigned between 2130 and 1930 B.C. Usertesen I erected at Thebes the earliest and loftiest of the obelisks, which measured about a hundred feet from apex to base. His colossal statue in red granite has been discovered near Tunis. Usertesen II and III completed the subjugation of Lower Nubia. Consult Breasted, 'His-

tory of the Ancient Egyptians' (New York 1908).

USHANT, ŭsh'ant (French, OUESSANT, wĕs-sŏn), France, an island 15 miles off the west coast of the department of Finistère, to which it belongs; area, six square miles. It is almost entirely composed of granite, with a bold and rocky coast, which is accessible only at some points. Fishing and the rearing of sheep are the principal occupations of the inhabitants. Saint Michel is the chief village. Ushant, with the surrounding islets, forms a commune having a pop. of about 2,568. Near the island in 1759 Sir Edward Hawke defeated Admiral Conflans and in 1778 Admiral Keppel and Count D'Orvilliers fought an indecisive battle.

USHER, Hezekiah, American bookseller: b. England, about 1615; d. Boston, Mass., 14 March 1676. Thomas ('History of Printing,' 1810) calls him "the first bookseller in English America of whom I can find any account." He was in Cambridge as early as 1639, but in 1646 set up business in Boston. As agent of the Society for the Propagation of the Gospel, he purchased the types and paper for the printing of Eliot's 'Indian Bible' (see ELIOT, JOHN), and directed all the transactions in connection therewith. This was the first Bible printed in the colonies. Usher was a founder of the Old South Church of Boston (1669).

USHER, or USSHER, James, Irish prelate, archbishop of Armagh: b. Dublin, 1581; d. Reigate, Surrey, 1656. He took orders in 1601, and in 1607 was appointed professor of divinity at Trinity College, Dublin, and chancellor of Saint Patrick's Cathedral; in 1620 bishop of Meath; in 1623 Irish privy-councillor and primate of Ireland in 1624 as archbishop of Armagh. His notions of church government verging toward Presbyterianism, his enemies took advantage of this to attempt to destroy his credit with James I; but he enjoyed to the last the esteem of that king. He attended Strafford in prison and at his execution. During the civil war he was a stanch adherent of Charles I, and witnessed the execution of the king. After that event he experienced civility and flattering promises from Cromwell, who finally ordered that he should be buried in Westminster Abbey. Archbishop Usher carried on an extensive correspondence with the learned in various parts of Europe, and was a man of great erudition. He wrote a number of works, the principal of which are the 'Annals of the Old and New Testament,' which forms the basis of the Biblical chronology in King James' version of the Bible; 'Britannicarum Ecclesiorum Antiquitates.' Consult Aikin, 'Lives of Selden and Usher' (1812).

USHER, John, American colonial executive: b. Boston, Mass., 27 April 1648; d. Medford, Mass., 1 Sept. 1726. He was the son of Hezekiah (q.v.). As a bookseller he was the first in the colonies to obtain a copyright for printing, the work being a revised edition of the laws of Massachusetts. He was colonel of militia, treasurer of Massachusetts and agent in London for the Massachusetts colony for the purchase from Sir Ferdinand of Gorges of the title for the district of Maine (1677). In 1692–97 he was lieutenant-governor of New Hampshire and again from 1702 till his death.

USHER, Roland Greene, American historian: b. Lynn, Mass., 3 May 1880. He graduated at Harvard (1901), taking history honors (1902) and rounding out his education in Oxford, Paris and Cambridge. He was assistant in history in Harvard (1904–07), instructor there (1907–10) and professor since 1914. Among his numerous writings are 'The Rise of the American People' (1914); 'Pan-Americanism' (1915) and 'The Challenge of the Future' (1916).

USKUP, oos'kŭp, or USKUB, anciently called **SCUPI, SKOPIA,** or **SKOPLIE,** European Turkey, the capital of a sanjak in the vilayet of Kosovo, situated on the river Vardar, 65 miles northwest of Monastir, 110 miles northwest of Saloniki, on the railroad from Saloniki to Belgrade and the branch line to Mitrovitza. It was the scene of a battle during the Balkan War 26 Oct. 1912. It has a handsome mosque, a castle, a Byzantine aqueduct and a modern trade-school. The chief manufactures are leather, metal ware and cloth and the town is an important trade centre for grain, wool and fruit. Pop. about 33,000.

USNEA, a genus of fruticose lichens, attached only in one place, with a shrub-like appearance. They are often pendulous, as is the old man's beard (*U. barbata*) which hangs in long tassels and festoons from the bark of trees or their branches, is gray-hued and resembles somewhat in habit the *Tillandsia. Usnea* is also known as necklace-moss, or hanging moss.

USPALLATA (oos-päl-yä'tä) **PASS,** Chile, a pass over the Andes between Chile and Argentina, 90 miles east of Valparaiso, and at the southern base of Mount Aconcagua. Its highest point is about 12,800 feet above the sea and the Trans-Andine Railroad passes over it.

USSELINX, William, one of the greatest promoters of American colonization and founder of the Dutch West India Company, under which New Netherland, and of the Swedish West India Company, under which Delaware was settled: b. of Walloon parentage at Antwerp in 1567; d. 1647. In his early manhood he visited the Azores, which in 1431 had been rediscovered and colonized by the Netherlanders, and learned the "mystery" of Spanish colonization. From this archipelago the ships bound for the New World made their starting point westward over the Atlantic — the line between Sandy Hook and the Azores being almost that made by a ruler laid on the map. In this chief centre of colonial business Usselinx gained a rich experience, besides being in a Spanish prison for a time. From 1591, when he returned to the Netherlands, Usselinx began to talk, and later to agitate, in favor of Dutch trade with America. After his intense activity, by voice, pamphlets and general publicity, the Dutch West India Company, a mighty, armed corporation was formed in 1623 for activity against the Spaniards, who claimed nearly all of America. Under the company's flag great fleets were sent to South America and in 1624 30 families of Walloons, or refugee French-speaking Belgians, to New Netherland. These began the settlement and the tilling of the soil in the area now comprising the four Middle States, New York,

New Jersey, Pennsylvania and Delaware. In later life Usselinx entered the service of the king of Sweden and organized the forces that led to the Swedish settlement of Delaware. Returning to Holland in 1641 he engaged in large operations in drainage and soil-reclamation, utilizing treasure dug up from sunken ships of the Spanish Armada. About 1647 he disappeared from view. Within 30 years past a portrait of him was discovered and hangs in the Rijks Museum at Amsterdam. Usselinx, who was very influential in France and Germany, was a citizen of the world, believing that God "formed the earth to be inhabited," replenished and subdued. In addition to the Dutch bibliography consult G. M. Asher's 'Essay on the books and pamphlets relating to New Netherland' (Amsterdam 1854–67) and the exhaustive monograph by J. Franklin Jameson, 'Willem Usselinx' (New York 1887).

USSHER, James. See USHER, or USSHER, JAMES.

USTICA, oos'tē-kä, Italy, a small island in the Tyrrhenian Sea, 40 miles north of Palermo, Sicily. It is three miles long and two miles broad and has a fortified harbor with a lighthouse. It has been used as a penal colony. Pop. about 2,000.

USTILAGINACEÆ, the family of minute fungous plants called smuts. See FUNGI.

USUFRUCT, *in law,* the right to use and enjoy the things of another person and to draw from them profit, interest or advantage without reducing or wasting them. It is the most important of personal servitudes, servitude being the term for the right to use the property of another, whether real or personal. It may be established in any property which is capable of being used so far as is compatible with the substance of the thing not being destroyed or injured. This right may either be exercised directly, or may be leased or sold. The one possessing it is termed the usufructuary. He is bound not to impair the property and must furnish security for the restoration of it. Reasonable wear and tear and aging and natural death of animals do not call for replacement, however. A quasi-usufruct is recognized in the case of certain perishable things or "consumptibles." For instance, perishable fruit may be preserved and sold, eaten, etc. In such case the equivalent in kind and quantity, or in value, is held to represent the things destroyed or impaired by use. There are works on the subject by Genty (1859) and Hanausek (1879).

USUMACINTA RIVER (oo-soo-mä-sēn'tä), Central America, formed by the junction of three head streams, the Chixoy, Pasion and Lacantum, rising in Guatemala, for some distance in its middle course being the frontier line between Guatemala and Mexico. It flows northwestward through the states of Chiapas and Tabasco, Mexico, and empties into the Gulf of Mexico after a course of about 400 miles. A navigable branch also flows eastward into the Laguna Terminos, opening into the Gulf of Campeachy, while another branch flows westward into the Tabasco (q.v.).

USURY. If the term "usury" is to be defined, as in the strictly legal sense, as the illegal profit demanded by a lender for the loan of money or other property, it will be found that this offense against society is almost as old as society itself. Even in the earliest of Biblical days, for example, usury was practised so generally that the Lord uttered his warning against the custom: "Thou shalt not lend upon usury to thy brother, usury of money, usury of victuals, usury of anything that is lent upon usury. Unto a stranger thou mayest lend upon usury; but unto thy brother thou shalt not lend upon usury, that the Lord thy God may bless thee" (Deut. xxiii, 19, 20). Until comparatively recent times the word "usury" had many definitions and was used to embrace several essentially different social phenomena. In the Old English application it denoted any sort of interest upon money loaned rather than in the more modern signification which has made it applicable only to the unlawful contract exacting that the loan of money be repaid with exorbitant interest for its use. In fact, if one were to trace the history of the word back through the centuries that have passed since the Mosaic days it would be found that it had as often been applied to the strictly moral and legal methods of procuring just interest for capital invested as to those concerning which a moral if not a legal taint might be attached.

History.—The earliest interpreters of the laws of Moses certainly condemned the illegal practice of usury, and yet they did not forbid the taking of interest in payment for the loan of money, but expressly stipulated that such interest should be charged to strangers. It must be admitted, however, that this reading of the law was largely the result of the social conditions which existed in Israel at this time. In the first place the Israelities were neither a rich nor a commercial people, and the laws and regulations under which they lived were apparently not framed with the purpose of enabling them to become so. Their object, therefore, was to maintain their entity as a nation and to preserve the family inheritances which enabled them to continue happily their frugal mode of life. If the Israelites borrowed, therefore, it was not with a view to profit or to enable them to improve their condition, but simply from poverty and to secure to them some absolute necessity of life. To exact from such persons more than was lent, therefore, would have been both sinful and unjust. The result is denoted by the fact that among the ancient Israelites loans were made merely in cases in which there were poor persons who required assistance to tide them over present difficulties, and never for the purpose of enabling an avaricious man to increase his wealth at the expense of his poorer neighbor. This restriction, however, did not apply in the case of the stranger who was in need of financial help, and the extortion of usury was one of the several means resorted to by the Israelites to ruin the Canaanites and the other stranger-people who remained in the land.

As time passed the public attitude toward usury underwent a decided change, and society, which had branded all lending as immoral and all interest as "usury," because the lending had so generally resulted in cruelty and hardship to the borrower, finally began to feel that all lending was moral and honest, and it was under these conditions that the term "usury" was first applied to every method of receiving interest

upon capital invested, an attitude that remained unchanged for many centuries.

One of the most interesting and instructive features in the study of the economic progress of society is that which enables one to follow the various changes that have occurred in the methods of money lending. It has already been shown that the ancient Israelites borrowed only from necessity and not from the possibility of furthering any commercial interest, and this condition, according to Grote, not only prevailed in Greece, but applied to nearly all parts of Europe during the early Middle Ages.

In its inception the economic theory of the loaning of money did not contemplate the possibility that anyone might desire to raise a loan for the purpose of investment or to secure capital with which to carry one's business interests to a more successful outcome. In those early ages the commercial sense had not been widely developed and such business interests as those represented by the modern banker and broker were unknown, a condition that was not unfavorable to the extension of the practice of usury whenever and wherever there were laws permitting it. The ancient laws relating to loans read strangely to the modern student and can scarcely be comprehended if they are not considered in connection with the conditions of the times. If the Mosaic laws are taken as an example, the reader must place himself in a position to appreciate the Biblical point of view before he can hope to approximate fairly their justice to both borrower and lender. It must be remembered that the land (that is, the world), belonging originally to its Creator, had been given by God to the descendants of Abraham, and liberality to the poor had been one of the conditions under which this gift had been made. Naturally, therefore, the needy Israelite felt that obtaining loans was a right which belonged to him, while the more wealthy people of Israel, feeling that all their property was a loan direct from the hand of God, did not, in the beginning at least, object to giving a small portion of their plenty for the relief of the destitute. Under such conditions the execution of this law of lending was clearly supported by all the force that the recommendation of the constitution itself could bring to bear upon it, and it was not until the selfishness of man commenced to exert a baneful influence that definite laws were promulgated, laws that made the duty of lending the express command of God. While the justice of such legislative enactments may be questioned, especially when viewed from the position of present-day society, their benignity is no longer a matter of doubt when the principle of the divine origin of property is accepted as the basis of ownership, and as this was the polity upon which the entire Mosaic commonwealth was constructed, the laws adopted for the government of the borrower and the lender assume a more just and reasonable position in the estimation of modern thought. In substance these laws provided that the destitute Israelite might borrow what he required for his necessities without interest, either in money or produce; at the end of each seven years there was a remission of debts when every creditor was supposed to remit such money or produce as he had lent, and a prospective borrower was not to be refused such necessities as he might require even when the year of the remission was at hand. While the Mosaic law strictly forbade the charging of interest, it did not prevent the acceptance of pledges, which were legally protected in such manner as to prevent any hardship falling upon the borrower. For instance, the lender was forbidden to accept a mill or the upper millstone in pledge, it being held that they were too much a necessity of life; if raiment should be taken it was required that it must be returned before sunset, lest it be needed during the night, while in the case of a widow's raiment, its acceptance was forbidden under all circumstances. Under the Mosaic law a creditor was forbidden to enter a house for the purpose of reclaiming a pledge, although he might stand without until the borrower should come to him and return it, and while the statutes did not prohibit temporary bondage in the case of insolvent debtors, they provided that the Hebrew bondsman should not be held longer than the year of jubilee, or the seventh year at the most.

If these were the laws that governed the financial relations of Israelites among themselves, however, the same leniency did not apply to the Israelite's treatment of the stranger. For example: interest might be taken from a foreigner, and, at the end of the seventh year, the principal as well as the interest might be exacted. Less restrictions were placed upon pledges taken from foreigners, and the foreign debtor held in bondage was not entitled to exact his release at the coming of the jubil e, and yet even these laws were humane in comparison with those of Rome, which not only provided for the enslavement of the debtor, but even permitted the creditor to put him to death, an extremity, however, to which, according to the best authorities, the Romans were never known to have resorted.

The provisions of the Hebrew law which permitted the lender to collect both principal and interest from a stranger and which placed the stranger at the mercy of the creditor until such loans were repaid was the beginning of the practice of usury among this people, but many centuries elasped, as it shown by reference to Proverbs, or to the Psalms, before the exaction of usury from another Hebrew was regarded otherwise than as a discreditable act. By the time of the birth of Christ, however, the original spirit of the law seems to have been forgotten, for the borrowing and lending of money then prevailed without regard to any race limitations.

The practice of mortgaging land and of paying exorbitant interest for money obtained upon such surety was a Jewish custom which grew up during the days of the Captivity. Although condemned by Nehemiah as being in direct violation of the law, and denounced by Jesus Christ, whose new law of love required the righteous man to give to all who asked of him, and to lend to his enemies, "asking for nothing again," the mortgaging of property has continued throughout the East. In the beginning and for a long period 12 per cent was generally the interest charged, but later, under Turkish rule, and despite the warnings of the Koran, which also forbids usury, from 40 to 50 per cent was exacted.

In ancient Greece the practice of usury prevailed to such an extent that in Athens, about

595 B.C., the bulk of the population were bound in practical slavery. Originally free and small proprietors, they had continued to borrow from the rich until the majority of them had placed themselves completely at the mercy of the aristocracy, and even those who nominally owned their land were not only unable to pay the money they owed but were compelled to erect on their land huge stone pillars, monuments to advertise their debts, which bore the name of the plutocrat to whom they were so seriously indebted. At last Solon appeared and with him the reform legislation that made Athens once more a free city, for the radical remedy which he applied to the financial abuses formally put an end to the law of bankruptcy resting upon slavery, and practically overcame the evil effects of the entire system of usury. Realizing that such a serious condition required a firm hand, Solon first proclaimed a general *seisachtheia,* which provided that all debts made upon the person of the debtor or upon the surety of his land should become void. At the same time his legislation stipulated that bodily security should never again be accepted and that surety in land should rest only within a portion of the property. These reforms, which were certainly distinctly modern in their character, were so effective that the evils which had once threatened the security of Athens were no longer experienced, and although the rate of interest charged upon loans was still sometimes exorbitant — a condition which must exist whenever the rate is left to be determined by free contract — the restriction of the right of attachment was the means of preventing many abuses.

The conditions exising in Rome during the early days of the nation were similar to those which prevailed in Greece, although in Rome there was no Solon to legislate reform measures that could really reform. As a result more than five centuries passed before the Roman debtor was accorded the relief that had saved Athens, and, by that time, it was too late for any legislation to preserve the identity of the middle class. In the beginning Rome resembled Athens in that the mass of its people were farmers living on their own small estates, and, as in Athens, these yeomen soon became overwhelmed by the debts that war and taxes had forced upon them. A protest was made and, in 500 B.C. the Twelve Tables were adopted as a remedy, the theory being that the stipulation of a maximum rate of interest would be all that was necessary to overcome the prevailing evil. So far from accomplishing this purpose the attempt to regulate the rate of interest failed utterly and as no alterations had been made in the law which actually governed debt, it was less than three centuries before practically all the free farmers had become enslaved. It was not until the dictatorship of Julius Cæsar, in fact, more than five centuries after Solon, that the Athenian remedy was adopted and the law of debt really abolished. It has been stated that, at this time, while the rate of interest upon first-class properties in the city of Rome was only about 4 per cent, in the provinces the rate was increased to 25 and often 50 per cent. After pronouncing the accumulation of arrears illegal, Justinian established a rate of 6 per cent for all loans except those of a mercantile character, in which case 8 per cent was allowed, and public sentiment, at last aroused to the influence of usury upon the social and economic fabric of the nation, stamped it as such a pernicious crime.

Forbidden by legal enactments and condemned by the moralists it was but natural that the practice of usury should be just as severely censured by the Fathers of the Early Church. They not only held the custom up to detestation, but they passed regulations prohibiting a usurer from obtaining ordination, while the Council of Nice, one of the many councils which took action upon the subject, carried its decree to such an extent as to stipulate that "if anyone, after this decree, shall be found to take usury, or demand the principal with half the increase of the whole, or shall invent any such methods for filthy lucre's sake, he shall be degraded from his order and have his name struck out of the roll of the Church." The importance of ecclesiastical disapprobation in such matters is shown by the fact that all the decrees of the Apostolic Canons; the Council of Eliberis; the first and second councils of Arles; the first and third councils of Carthage, and the Council of Laodicea and of Trullo, had great effect in discouraging the practice of usury among the Christian races.

The natural consequences of this general condemnation of usury by the highest tribunals of the Church was the excuse for the adoption of the usurious methods by the Jews. In their case the laws prohibiting extortionate interest had so far become a dead letter that the race question was never considered when the matter of loaning money was under discussion. Had the Jews still adhered to the ancient Mosaic law, however, its provisions which permitted them to charge interest to the stranger and to collect both principal and interest from him under the most extreme penalties for failure to meet such obligations would have been sufficient authority for them to have become the money lenders of Europe. Moreover, since the begining of the Christian era the term "usury" had also been applied in the sense of receiving a reasonable rate of interest for the use of money loaned, and as this had long been regarded as an allowable practice, one which was no more contrary to the Hebrew law of love than the ordinary acts of buying or selling merchandise for gain, they felt themselves at perfect liberty to enter this field of commerce which had so conveniently been deserted by the Christians. That they often abused their privileges and conducted their business in a manner that was far from consistent with the Hebrew principles of equity, even when applied to the stranger, is, of course, beyond question; but these were the abuses of a system which time had made necessary and it was such abuses that have been responsible for much of the Jewish persecution which has darkened so many pages of history, for it was undoubtedly largely on account of their practice of money-lending and the determination shown by them in the collection of the last penny of both principal and interest that made the race so heartily detested and liable to such gross ill-treatment at the hands of the people. An interesting illustration of this popular animosity was exhibited at the time when Henry III granted the charters to Newcastle and Derby, for by these documents Jews were forbidden to

live in either place, and as late as 1290 they were expelled in a body from the kingdom and were not permitted to return until the days of Cromwell, in spite of the fact that, long before their banishment, Christians had already commenced to accept interest upon money loaned and that the business of money lending had ceased to be exclusively a right of the Jews.

The history of usury in England begins during the reign of Edward the Confessor, for it was at this time that the exaction of exorbitant interest was first prohibited. By 1126 that law had so far become obsolete that the practice of usury was forbidden only to the clergy. In 1199 Richard I decreed that the rate of interest should be restricted to 10 per cent and this remained the legal rate until 1624, when it was reduced to 8 per cent. In 1651 a still further reduction to 6 per cent was made, and, in 1714, the rate was established at 5 per cent, remaining unchanged until 1833, when, during the reign of William IV, bills not having more than three months to run were exempted from the operation of the laws against usury. Under Victoria this exemption was extended to bills payable in 12 months, and later it was enacted that bills of exchange and forbearances of money above £10 should not be affected by the usury laws. At present the legal rate of interest in Great Britain is 5 per cent, unless it can be shown that a different rate was agreed upon between the contracting parties. Even then the debtor can claim relief in court from a "harsh and unconscionable" agreement.

Usury in the United States.— Usury was one of the subjects which received early attention at the hands of the legislatures of the various States. In most instances the crime is defined as "the illegal profit required and received by the lender of a sum of money from the borrower for its use. To constitute a usurious contract it is required that there be a loan under an agreement that the money shall be returned to the lender, together with interest greater than that fixed by law." Of course, the laws in relation to usury vary under the statutes of the different States, but, in almost every case, by the addition of a bonus to the interest in which the sum is greater than the legal interest, the contract is held to be usurious, and, in the absence of any statute regarding such usury, relief may be obtained through courts of equity. In every State, however, care has been taken to distinguish between usury, applying the word in the modern sense of "unjust exaction," and interest on capital, for the progress of society has been in such a direction that the position of borrower and lender has now assumed an entirely different aspect. To-day the borrowing for commercial purposes represents transactions of overwhelming importance to the financial world, whereas the act of borrowing for purposes of necessity has become comparatively unimportant. As the result circumstances have so changed that the old laws would be useless in dealing with any present-day usury evil, and the statutes enacted by the various States are of the character which seems best fitted to cope with the conditions of the times.

These laws, briefly summarized for tabulation, are as follows:

THE USURY LAWS OF THE UNITED STATES.

STATES	Legal rate of interest, per cent	Interest allowed by contract, per cent	Penalties for usury
Alabama	8	8	Forfeiture of interest.
Alaska	6	10	Forfeiture of double amount of interest.
Arizona	6	10	Forfeiture of interest.
Arkansas	6	10	Forfeiture of both principal and interest.
California	7	Any rate	No provision.
Colorado	8	Any rate	No provision.
Connecticut	6	12	Fine and imprisonment.
Delaware	6	6	Forfeiture of principal and interest.
D. of Columbia	6	6	Forfeiture of interest.
Florida	8	10	Forfeiture of interest.
Georgia	7	8	Forfeiture of excess interest.
Hawaii	6	12	Forfeiture of interest.
Idaho	7	12	Forfeiture of interest and costs of action.
Illinois	5	7	Forfeiture of interest.
Indiana	6	8	Forfeiture of interest over 6 per cent.
Iowa	6	8	Forfeiture of interest.
Kansas	6	10	Forfeiture of double the amount of usurious interest.
Kentucky	6	6	Forfeiture of excess interest.
Louisiana	5	8	Forfeiture of interest.
Maine	6	Any rate	No provision.
Maryland	6	6	Forfeiture of excess, with interest thereon.
Massachusetts	6	Any rate*	No provision.
Michigan	5	7	Forfeiture of interest; if paid, not recoverable.
Minnesota	6	10	Forfeiture of principal and interest.
Mississippi	6	8	Forfeiture of interest.
Missouri	6	8	Forfeiture of interest.
Montana	8	Any rate	No provision.
Nebraska	7	10	Forfeiture of interest.
Nevada	7	Any rate	No provision.
New Hampshire	6	6	Forfeiture of three times the amount of excess interest.
New Jersey	6	6	Forfeiture of interest and costs.
New Mexico	6	12	Fine and forfeiture of twice the amount of excess interest.
New York	6	6†	Forfeiture of principal and interest.
North Carolina	6	6	Forfeiture of interest.
North Dakota	6	10	Forfeiture of interest.
Ohio	6	8	Forfeiture of all interest over 6 per cent.
Oklahoma	6	10	Forfeiture of interest.
Oregon	6	10	Forfeiture of principal and interest.
Pennsylvania	6	6	Forfeiture of excess interest.
Rhode Island	6	30	No provision.
South Carolina	7	8	Forfeiture of interest and liability.‡
South Dakota	7	10–12	Forfeiture of interest.§
Tennessee	6	6	Forfeiture of excess interest.
Texas	6	10	Forfeiture of double amount of usury.
Utah	8	12	No provision.
Vermont	6	6	Forfeiture of excess interest.
Virginia	6	6	Forfeiture of interest.
Washington	6	12	Forfeiture double the accrued interest and costs.
West Virginia	6	6	Forfeiture of excess interest.
Wisconsin	6	10	Forfeiture of all interest.
Wyoming	8	12	Forfeiture of interest.

* Not more than 18 per cent can be collected on loans of less than $1,000. † On call loans of $5,000 or upward any rate of interest may be charged. ‡ Embraces liability to separate action to the extent of double the amount of usury. § With real estate security, 10 per cent.

Bibliography.— Jeremy Bentham's 'Defense of Usury' (1816); Böhm-Bawerk, 'Capital and Interest' (London 1890); Hume's 'Essay on Interest'; Mommsen's 'History of Rome' (London 1875); Palgrave, R. H. I., 'Dictionary of Political Economy,' article 'Interest and Usury' (London 1910); White, A. D. W., 'History of the Warfare of Science with Theology in Christendom' (New York 1896); also Martin Luther's sermon, "Von dem Wucher" ('The Usurer,' 1519). See INTEREST.

UTAH, the 45th State in the Union, takes its name from a tribe of Indians (Utes or Yutas) whose habitat was in the region settled by the founders of this Commonwealth. It lies between lat. 37° and 42° N. and long. 109° and 114° W., comprising an area of 84,000 square miles.

General Features.— The country is crossed, mostly north and south, by mountain ranges, the principal one being the Wasatch Range, which might be termed the backbone of the State. East of this natural wall is a region drained by Green and Grand rivers, affluents of the Colorado, and to the west is the Great Salt Lake (q.v.) and its contiguous desert. This lake extending north and south for about 75 miles, with a width of nearly 50 miles and a depth in places of 40 to 50 feet, lies in the heart of "The Great Basin," a vast arid intermountain plateau, whose eastern rim is in the Wasatch Range, while its western limit is the Sierra Nevada. The lowest point of altitude in Salt Lake Valley is 4,210 feet above sea-level. Utah Lake (q.v.), a small fresh-water body 40 miles southward, is connected with the Salt Lake by the river Jordan, a circumstance which induces a comparison between Utah and the land of Palestine. Broken mountain chains in central, eastern and southern Utah alternate with valleys and plateaus. Here and there are fresh lakes and rivers, owing their existence mainly to the melted snows flowing in crystal torrents from the rugged canyons. Hot and warm mineral springs, with healing waters, gush forth in places at the foot of snow-crowned ranges.

Scarcity of timber and fresh water have been the country's serious drawbacks from the beginning. Trees are found only in the mountains and along the water courses, which are few and far between. Along the bases of the hills the soil is naturally productive, and when irrigated brings forth abundantly. In other places it is either pure desert, hopelessly barren or so devoid of moisture and so strongly impregnated with salt and alkali that cultivation is almost impossible. The climate is healthful and delightful. The mountains around the valleys ward off the keen wintry winds and the rarity of the high atmosphere modifies the summer heat. The average annual rainfall is about 12 inches. In southwestern Utah — the valley of the Rio Virgen — the climate is semi-tropical. The Utah scenery will compare with any in the world. Here are mountains as grand as the Alps of Switzerland and sunsets more gorgeous than those of Italy and Greece. In the south are marvelous canyons, mammoth stone bridges and giant monoliths, master works of nature, worthy to be classed with the wonders of all time.

The land, in spite of its dryness, is one of rich and varied resources. Where agriculture has succeeded, vast quantities of cereals are raised, with all varieties of fruits and vegetables common to the north temperate zone. The mountains are nature's treasure vaults, containing inexhaustible deposits of precious and useful metals. Gold, silver, lead, copper, iron, coal and a hundred other minerals are found. The mountains and lakes could furnish salt and soda to supply a continent, and from the quarries come marble, onyx, granite and all kinds of building stones for the construction of temples, churches, schoolhouses, stately public edifices and handsome private homes, which now adorn and beautify the once empty and desolate land.

Geology.— The greater part of the rock of the interior mountain area is a series of conformable stratified beds reaching from the Archean to the late Jurassic times, with the addition of thick deposits of Cretaceous and Tertiary sedimentaries in the Plateau section. The raising of these beds produced the Sierras and the Wasatch, and later, by crustal dislocation within the included area, the parallel ranges in the Great Basin were formed. It is observed that certain structural features of the local geology are nearly parallel with the meridian; hence the precious metals are found arranged in parallel longitudinal zones. It is believed that the present Great Basin was part of the land area that arose early from the ocean, that during the Mesozoic period the basin was drained into the great Cretaceous sea, which had divided North America into two continents, and which was abolished by the uplift of the Plains and Plateau region, and that the Great Plains and the Great Basin were raised to their present altitude at the beginning of the Cenozoic period, where the uplifting of the continent between Saint Louis and San Francisco began. Erosion in places has been extensive and has exposed or carried away everything from Cretaceous to Pre-Cambrian. For details of the geological features of the State consult the publications of the United States Geological Survey.

Fauna.— The mountains of Utah abound in game — bear, deer, elk, antelope, grouse, prairie chickens, etc.; the fresh lakes and streams are well stocked with fish in numerous varieties, and lake and river margins are the haunts of wild geese and ducks in abundance. Fish cannot live in the Salt Lake, owing to the intense salinity of its waters. They were once supposed to have no life, but a small brine shrimp and three kinds of insects have been found therein. These waters are eight times brinier, and consequently far more buoyant, than those of the ocean. Saltair, on the eastern shore, is one of the largest bathing pavilions in the world.

Mining.— Though primarily an agricultural State, with manufacture and stock-raising as strong subsidiary features, Utah in recent years has forged to the fore and taken a rightful place among the great mining commonwealths of the nation. Her mining history began virtually with the advent of the railroad (1869–70), prior to which period, though mines had been discovered and opened, little headway had been made, owing to a lack of transportation facilities. The existence of valuable ore bodies was known to the earliest settlers, but their leaders did not encourage mining. "We cannot eat

UTAH.

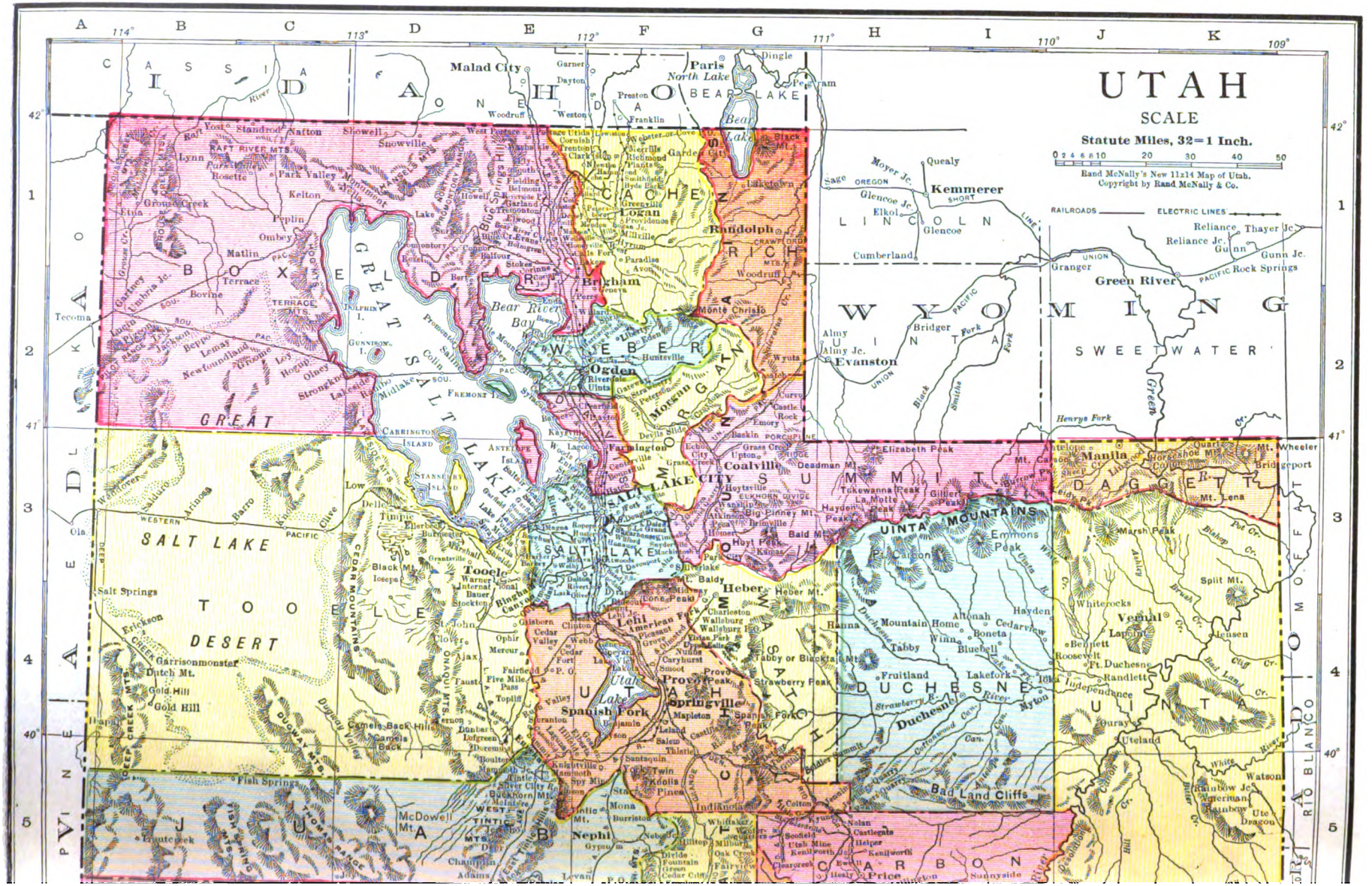
Estimated population, 434,083

COUNTIES

Pop.		
4,717	Beaver	B 8
13,894	Boxelder	C 2
23,062	Cache	F 1
8,624	Carbon	H 5
.....	Daggett	J 2
	(Pop. incl. in Uinta Co.)	
10,191	Davis	F 2
.....	Duchesne	H 4
	(Pop. incl. in Wasatch Co.)	
6,750	Emery	H 7
3,660	Garfield	E 9
1,595	Grand	J 7
3,933	Iron	B 9
10,702	Juab	C 5
1,652	Kane	E 10
6,118	Millard	B 6
2,467	Morgan	F 2
1,734	Piute	E 8
1,883	Rich	G 1
131,426	Salt Lake	E 3
2,377	San Juan	J 9
16,704	Sanpete	F 6
9,775	Sevier	F 7
8,200	Summit	G 3
7,924	Tooele	C 4
7,050	Uinta	J 4
37,942	Utah	F 4
8,920	Wasatch	H 4
5,123	Washington	B 10
1,749	Wayne	G 8
35,179	Weber	F 2

Incorporated Cities, Towns, Etc.

496	Alpine, Utah	F 4
2,797	American Fork	F 4
463	Bear River City, Boxelder	C 2
1,899	Beaver	D 8
2,881	Bingham Canyon	E 3
1,677	Bountiful	F 3
3,685	Brigham	E 2
693	Castle Dale	H 6
789	Castlegate	H 5
1,705	Cedar City	C 9
495	Centerfield	F 6
283	Charleston	G 4
564	Clarkston	F 1
976	Coalville	G 3
231	Corinne	E 1
656	Elsinore	E 7
525	Emery	G 7
2,296	Ephraim	F 6
846	Escalante	F 9
3,416	Eureka	E 5
1,218	Fairview	G 5
1,231	Farmington	F 3
651	Ferron	H 6
1,202	Fillmore	E 7
1,549	ForestDale, Salt Lake	E 3
875	Fountain Green	F 5
600	Garland	E 1
359	Glenwood	F 7
470	Goshen	F 5
1,154	Grantsville	E 3
628	Green River	I 7
950	Gunnison	F 6
2,031	Heber	G 4
816	Helper	H 5
553	Hinckley	D 6
800	Huntington	H 6
699	Hydepark	F 1
1,838	Hyrum	F 1
127	Joseph	E 7
733	Kanab	D 10
513	Kanosh	E 7
887	Kaysville	F 2
2,964	Lehi	F 4
722	Levan	F 5
989	Lewiston	F 1
7,522	Logan	F 1
1,771	Mammoth	E 5
2,433	Manti	F 6
534	Mapleton	F 4
485	Mayfield	F 6
331	Meadow	E 7
459	Mendon	F 1
1,047	Mercur	E 4
1,760	Midvale	F 3
838	Midway	G 4
1,014	Milford	C 8
353	Milliville	F 1
591	Minersville	C 8
615	Moab	K 7
1,227	Monroe	E 7
756	Morgan	F 2
1,223	Moroni	F 6
2,280	Mt. Pleasant	G 5
4,057	Murray	F 3
2,759	Nephi	F 5
515	Newton	F 1
31,404	Ogden	F 2
254	Ophir	E 4
648	Orangeville	G 6
1,338	Panguitch	D 9
620	Paradise	F 1
3,439	Park City	G 3
1,156	Parowan	D 9
2,397	Payson	F 4
1,618	Pleasant Grove	F 4
1,021	Price	H 5
1,020	Providence	F 1
10,645	Provo	F 4
533	Randolph	G 1
547	Redmond	F 6
2,559	Richfield	E 7
1,562	Richmond	F 1
1,737	St. George	B 10
693	Salem	F 4
1,082	Salina	F 7
117,399	Salt Lake City	F 3
1,037	Sandy	F 3
915	Santaquin	F 5
546	Sciplo	E 6
746	Scofield	G 5
1,865	Smithfield	F 1
3,464	Spanish Fork	F 4
1,100	Spring City	F 6
3,356	Springville	F 4
258	Stockton	E 4
2,753	Tooele	E 3
836	Vernal	K 4
424	Washington	B 10
358	Wellington	H 5
1,195	Wellsville	E 1
577	Willard	E 2


UTAH
SCALE
Statute Miles, 32=1 Inch.
0 2 4 6 8 10 20 30 40 50
Rand McNally's New 11x14 Map of Utah.
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RAILROADS
ELECTRIC LINES
A B C D E F G H I J K
114° 113° 112° 111° 110° 109°
42° 41° 40°
IDAHO
WYOMING
COLORADO
NEVADA
ARIZONA
Malad City
Paris
North Lake
BEAR LAKE
Bear Lake
Preston
Franklin
Weston
Dingle
Garner
Dayton
Woodruff
Soda Springs
Snowville
Standrod
Nafton
Howell
Lynn
Park Valley
Kelton
Grouse Creek
Etna
Peplin
Ombey
Matlin
Terrace
Bovine
Tecoma
RAFT RIVER MTS.
BOX ELDER
CACHE
Logan
Providence
Millville
Hyrum
Paradise
Avon
Randolph
RICH
Woodruff
Brigham
Monte Christo
Bear River Bay
GREAT SALT LAKE
Ogden
Huntsville
Wyuta
Curtis
Castle Rock
Emory
Baskin
Grass Creek
Upton
Deadman Mt.
Coalville
Elizabeth Peak
Manila
Mt. Wheeler
Bridgeport
Mt. Lena
Farmington
Centerville
Bountiful
SALT LAKE CITY
Heytsville
Big Piney Mt.
Hayden Peak
Gilbert Peak
Tokewanna Peak
La Motte Peak
Baldy Mt.
Huyt Peak
Kamas
SUMMIT
DAGGETT
UINTA MOUNTAINS
Emmons Peak
Mt. Carson
Marsh Peak
Split Mt.
Whiterocks
Vernal
Lapoint
Jensen
Bennett
Roosevelt
Ft. Duchesne
Randlett
Independence
Uinta
Ouray
Uteland
Watson
Rainbow Jc.
Rainbow
Ute
Dragon
Bad Land Cliffs
Hayden
Altonah
Cedarview
Boneta
Bluebell
Mountain Home
Winn
Tabby
Fruitland
Lakefork
DUCHESNE
Strawberry Reservoir
Strawberry Peak
Tabby or Blacktail Mt.
Provo Peak
Provo
Springville
Spanish Fork
Mapleton
Heber
Heber Mt.
Lehi
American Fork
Pleasant Grove
Orem
Lindon
Charleston
Wallsburg
Vivian Park
Hanna
Duchesne
Duchesne River
Myton
Cottonwood Can.
Utah Lake
UTAH
Goshen
Cedar Valley
Fairfield
Five Mile Pass
Topliff
Ophir
Mercur
Clover
Johnson
Eureka
Tintic Mt.
Silver City
Buckhorn Mt.
Mona
Burriston
Nebo
Nephi
Indianola
Colton
Scofield
Utah Mine
Kenilworth
Castlegate
Helper
Price
Sunnyside
CARBON
Wellington
Green River
Granger
Reliance
Thayer Jc.
Gunn
Gunn Jc.
Rock Springs
Evanston
Almy
Almy Jc.
Bridger
Cumberland
Kemmerer
Quealy
Moyer Jc.
Glencoe Jc.
Elkol
Glencoe
Sage
OREGON
SHORT
LINCOLN
SWEETWATER
UNION
PACIFIC
Henrys Fork
Green
Black
Smiths Fork
Bear River
Weber
Ogden
Morgan
Davis
Salt Lake
Utah
Juab
Millard
Sevier
Emery
Carbon
Duchesne
Uintah
Daggett
Summit
Wasatch
Tooele
Great Salt Lake
Salt Lake Desert
Antelope Island
Stansbury Island
Carrington Island
Gunnison Island
Dolphin Island
Fremont Island
Promontory
Hansel Valley
Blue Creek
Bear River Mts.
Wasatch Mts.
Oquirrh Mts.
Onaqui Mts.
Cedar Mountains
Deep Creek Mts.
Dugway Mts.
Dugway Valley
Camels Back Hills
Camels Back
Fish Springs
Fish Springs Mts.
Fish Springs Range
Dutch Mt.
Gold Hill
Garrisonmonster
Erickson Creek
Salt Springs
Black Mt.
Iosepa
Grantsville
Tooele
Timpie
Low
Delle
Ola
Aragonite
Barro
Knolls
Lakeside
Saltair
Black Rock
Promontory Mts.
Hogup Mts.
Newfoundland Mts.
Lemay
Jackson
Beppler
Terrace Mts.
Gunnison I.
Dolphin I.
Midlake
Lakeside Mts.
Strongbow
Olney
Hogup
Lay
Grouse Creek Mts.
Raft River Mts.
Albion Mts.
Sublett Mts.
Malta
Elba
Almo
Oakley
Yost
Rosette
Ellis
Snowville
Standrod
Nafton
Showell
Lynn
Park Valley
Kelton
Grouse Creek
Etna
Peplin
Ombey
Matlin
Terrace
Bovine
Tecoma
Gardner
Umbria Jc.
Jackson
Beppler
Lemay
Newfoundland
Grouse
Lay
Hogup
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Antelope Island
Stansbury Island
Gunnison I.
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Oquirrh Mts.
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Hogup Mts.
Newfoundland Mts.
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Grouse Creek Mts.
Raft River Mts.
Albion Mts.
Sublett Mts.
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Park Valley
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Grouse Creek
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Wasatch Mts.
Oquirrh Mts.
Onaqui Mts.
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Deep Creek Mts.
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Fish Springs Range
Dutch Mt.
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Tooele
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Promontory Mts.
Hogup Mts.
Newfoundland Mts.
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Terrace Mts.
Gunnison I.
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Midlake
Lakeside Mts.
Strongbow
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Grouse Creek Mts.
Raft River Mts.
Albion Mts.
Sublett Mts.
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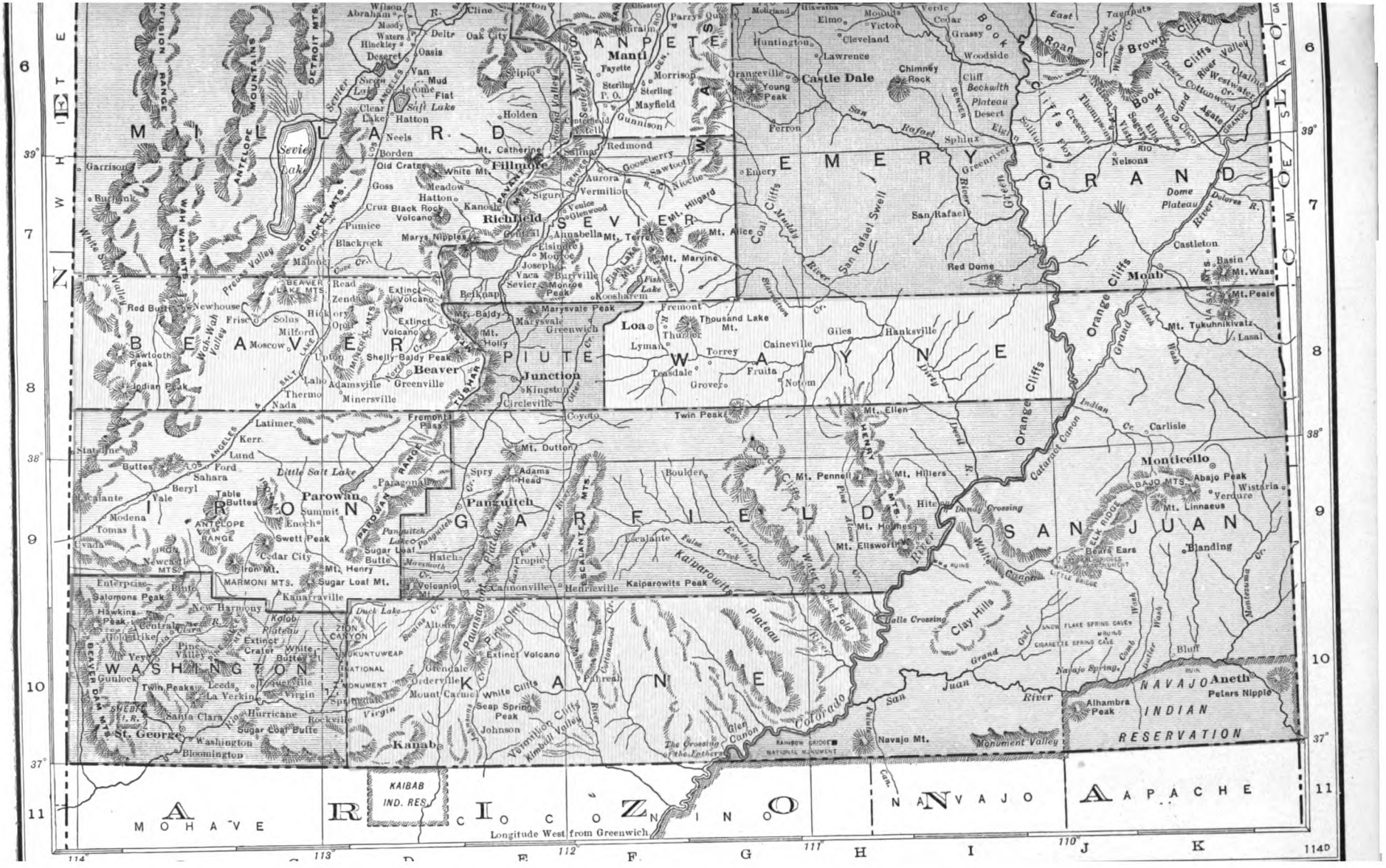
Elba
Almo
Oakley


SANPETE
MILLARD
SEVIER
EMERY
GRAND
BEAVER
PIUTE
WAYNE
GARFIELD
PARAWAN
IRON
WASHINGTON
KANE
SAN JUAN
Manti
Fayette
Sterling
Mayfield
Gunnison
Castle Dale
Huntington
Orangeville
Young Peak
Ferron
Emery
San Rafael
Nelsons
Red Dome
Moab
Castleton
Monticello
Abajo Peak
Abajo Mts.
Mt. Linnaeus
Mt. Peale
Mt. Waas
Mt. Tukuhnikivatz
Lasal
Mt. Ellen
Carlisle
Mt. Pennell
Mt. Hillers
Mt. Ellsworth
Mt. Holmes
Hite
Dandy Crossing
Bluff
Blanding
Beaver Ears
Navajo Spring
Aneth
Peters Nipple
Alhambra Peak
Navajo Mt.
Monument Valley
Glen Canon
The Crossing of the Fathers
Kaiparowits Plateau
Kaiparowits Peak
Escalante
Boulder
Henrieville
Cannonville
Tropic
Panguitch
Panguitch Lake
Parowan
Paragonah
Little Salt Lake
Cedar City
Iron Mt.
Mt. Henry
Sugar Loaf Mt.
Enterprise
Modena
Escalante
Beryl
Yale
Table Buttes
Summit
Enoch
Swett Peak
Newcastle
Kanarraville
New Harmony
Pine Valley
Gunlock
Veyo
Central
Hurricane
La Verkin
Leeds
Twin Peaks
Santa Clara
St. George
Washington
Bloomington
Virgin
Rockville
Sugar Loaf Butte
Zion Canyon
Kolob Plateau
Duck Lake
Kanab
Mount Carmel
Orderville
Glendale
Alton
Extinct Volcano
White Cliffs
Soap Spring Peak
Johnson
Vermilion Cliffs
Kimball Valley
Pahreah
Paunsaugunt Plateau
Pink Cliffs
Sevier Lake
Salt Lake
Clear Lake
Hatton
Holden
Fillmore
Mt. Catherine
Redmond
Salina
Aurora
Vermilion
Richfield
Sigurd
Glenwood
Annabella
Mt. Terrel
Mt. Alice
Mt. Marvine
Fish Lake
Koosharem
Loa
Fremont
Thousand Lake Mt.
Torrey
Caineville
Giles
Hanksville
Teasdale
Fruita
Grover
Notom
Thurber
Lyman
Junction
Kingston
Circleville
Beaver
Greenville
Adamsville
Minersville
Marysvale
Marysvale Peak
Mt. Baldy
Mt. Holly
Belknap
Coyote
Twin Peaks
Mt. Dutton
Adams Head
Spry
Sahara
Ford
Buttes
Kerr
Latimer
Fremont Peak
Indian Peak
Sawtooth Peak
Shelly-Baldy Peak
Frisco
Milford
Moscow
Newhouse
Red Butte
Garrison
Burbank
Oak City
Delta
Deseret
Oasis
Hinckley
Abraham
Wilson
Moody
Waters
Scipio
Yan
Mud
Lake
Jerome
Flat
Meadow
Goss
Hatton
Kanosh
Cruz Black Rock Volcano
Pumice
Blackrock
Malone
Cove Cr.
Read
Zenda
Extinct Volcano
Hickory
Orin
Solus
Lake
Thermo
Nada
Lake
Upton
Joseph
Monroe
Yaca
Sevier
Monroe Peak
Burrville
Elsinore
Central
Vermilion
Aurora
Gooseberry
Sawtooth
Nioche
Emery
Ferron
Sphinx
Elgin
Sinbad
Crescent
Thompsons
Cisco
Dewey
Westwater
Cottonwood
Agate
Grand
Ellis
Stagecoach
Whitewater
Clarks
Rio
Book Cliffs
Roan Cliffs
Coal Muddy
San Rafael Swell
Dome Plateau
Dolores R.
Orange Cliffs
Indian Creek
Canyonlands
Needles
Abajo Mts.
Elk Ridge
Wistaria
Verdure
Harts Draw
Comb Wash
Cedar Mesa
Butler Wash
Grand Gulch
Cigarette Spring Cave
Snow Flake Spring Cave
Bridges
Natural Bridges
Little Bridge
Ruin
Halls Crossing
Clay Hills
Fiddler Butte
Monument Valley
Rainbow Bridge
National Monument
Navajo Indian Reservation
Kaibab Ind. Res.
Mohave
Coconino
Navajo
Apache
Wah Wah Mts.
Antelope Mts.
Cricket Mts.
Detroit Mts.
Confusion Range
Beaver Lake Mts.
Mineral Mts.
Tushar Mts.
Pavant Mts.
Canyon Mts.
Sevier Valley
Pahvant Valley
Wah-Wah Valley
Meadow Valley
Escalante Mts.
Paria Plateau
Marvine
Hiawatha
Mohrland
Elmo
Mounds
Victor
Cleveland
Lawrence
Woodside
Cedar Grassy
Chimney Rock
Cliff
Beckwith Plateau
Desert
Huntington Cr.
Cleveland Reservoir
Joes Valley
Cottonwood Cr.
Ivie Creek
Cleveland Reservoir
Tavaputs
Book Cliffs
Roan Cliffs
Coal Cliffs
Muddy
San Rafael Swell
Green River
Dolores R.
Castleton
Basin
Mt. Waas
Mt. Peale
Mt. Tukuhnikivatz
Lasal
Orange Cliffs
Indian Creek
Canyonlands
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Abajo Mts.
Elk Ridge
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Antelope Mts.
Cricket Mts.
Detroit Mts.
Confusion Range
Beaver Lake Mts.
Mineral Mts.
Tushar Mts.
Pavant Mts.
Canyon Mts.
Sevier Valley
Pahvant Valley
Wah-Wah Valley
Meadow Valley
Escalante Mts.
Paria Plateau
Marvine
Longitude West from Greenwich
114°
113°
112°
111°
110°
114°
39°
38°
37°
6
7
8
9
10
11
A
B
C
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K

gold and silver," said the State founder, Brigham Young; "neither do we desire to bring into our peaceful settlements the rough element commonly found among inhabitants of mining camps, to vitiate the morals of our youth, overwhelm us by numbers and drive us again from our hard-earned homes." For these reasons he discouraged mining and advised the people to turn their attention to agriculture, stock-raising, manufacture and kindred pursuits. Most of his people — the Mormons — followed his advice, but some joined with the Gentiles in exploiting the mines. The honor of pioneering this important industry is given to Gen. P. E. Connor, the founder of Fort Douglas, a military post on the foothills east of Salt Lake City. In the latter part of 1863 Connor prospected in Bingham Canyon and located the Jordan mine. He afterward organized the West Mountain mining district and established a paper, *The Union Vedette*, heralding through its columns the opening of the Utah mines. In 1915 the mineral products of the State aggregated $61,081,633, as set forth in the following table:

Gold, ounces	189,107	$3,908,000
Silver, ounces	12,724,000	6,243,939
Copper, pounds	182,589,000	31,579,191
Lead, pounds	219,098,000	10,166,147
Zinc, pounds	22,643,000	3,325,362
Coal, tons	3,083,676	5,858,994
		$61,081,633

Utah ranks second among the States in the production of silver, third in lead, fourth in copper and sixth in gold. The known metal product of Utah for gold, silver, copper, lead and zinc alone, according to the United States Geological Survey, is valued at $691,301,832. The known dividends paid by the Utah metalliferous mining companies is $131,000,000. The estimated contents of Utah's coal fields, by the United States Geological Survey, is 196,000,000,000 short tons.

Agriculture.— The Utah soils are said to be the deepest and richest in the United States, extending in some instances to a depth of 40 feet. The following table shows her agricultural production for 1915:

Wheat, bushels	8,225,000	$6,662,250
Oats, bushels	4,600,000	1,886,000
Barley, bushels	1,377,000	633,420
Rye, bushels	195,000	126,000
Corn, bushels	391,000	238,510
Potatoes, bushels	2,600,000	1,690,000
Hay, tons	988,000	8,398,000
Sugar beets, tons	695,000	3,419,400
Alfalfa, seed, tons	50,000	450,000
Sweet clover, tons	7,000	54,000
Red clover, tons	500	5,700
Orchard fruit:		
Apples, bushels	436,000	501,400
Peaches, bushels	247,000	123,000
Pears, bushels	38,000	32,000
Orchard fruit (including cherries, apricots, plums and prunes)	.....	256,000
Small fruit	.....	700,000
Nursery products	.....	200,000
Flowers and plants	.....	100,000
Vegetables	.....	1,500,000
Dairy products	.....	3,000,000
Miscellaneous	.....	1,000,000
Eggs and poultry	.....	2,600,000
Honey	.....	100,000
Livestock	.....	10,000,000
Wool, pounds	16,000,000	3,520,000
		$47,195,680

Utah produces more sugar beets and barley to the acre than any other State; she is tied with two other States for first place in the yield of potatoes to the acre, and is second among the States in the yield of wheat per acre.

Banking.— There are about 22 national banks, about 75 State banks, about 15 private banks and a few loan and trust companies. The national banks have deposits aggregating $22,000,000, capital $3,500,000 and surplus $1,600,000. The 75 State banks have deposits aggregating $23,000,000, capital $4,500,000 and surplus $1,100,000. From 1860 to 1870 private banks developed. In 1872 the first national bank was established and in 1873 savings banks began their activities.

Finance.— The assessed valuation is estimated as $675,000,000. In 1919 the bonded debt of the State was $3,435,000. The State treasury report for 1917–18 shows the following conditions of the State's finances:

Cash on hand, 30 Nov. 1917	$1,223,960
Revenue, 1917–18	8,838,302
Total	$10,062,262
Disbursements	8,556,750
Balance on hand, 30 Nov. 1918	$1,505,512

Religion and Education.— Utah is the home of "Mormonism" and the Latter-day Saints form about 75 per cent of the church membership of the State. There are Catholics, Presbyterians, Methodists, Baptists, Christian Scientists and Congregationalists in small numbers. The percentage of illiterates in the population at the time of the last census was only 2.5, the number being 6,821, of whom 3,636 were foreign-born. Throughout the State school attendance is compulsory on all from 8 to 18 years for 30 weeks annually, unless lawfully excused to go into employment, in which case they must be in school at least 144 hours a year. There are 642 elementary schools with 2,707 teachers and 100,096 enrolled pupils; 45 public high schools with 742 teachers and 10,097 pupils. The State University had an enrolment in 1918 of 3,431 students distributed in its schools of Arts and Science, Mines and Engineering, Education, Medicine, Law, Commerce and Finance and Extension Division. The Utah Agricultural College in 1918 had an enrolment of 2,523 students. In addition to these public institutions, the Latter-Day Saints' Church operates a system comprising The Brigham Young University at Provo, with 1,184 students; four normal colleges with 1,958 students and five high schools with 2,845 students. Nine other private schools are maintained as follows: All Hallows College, Westminster College, Saint Mary's Academy and Rowland Hall, at Salt Lake; Sacred Heart Academy, Ogden; New Jersey Academy, Logan; Proctor Academy, Provo; New West Academy, Vernal; Wasatch Academy, Mount Pleasant.

Government.— The constitution, ratified by popular vote, 5 Nov. 1895, provides that the right of conscience shall never be infringed; that no public money or property shall be appropriated for the support of any ecclesiastical establishment; that the right of trial by jury shall remain inviolate; that no law shall be passed granting irrevocably any franchise, priv-

ilege or immunity, and that all laws of a general nature shall have uniform operation. Perfect toleration of religious sentiment is guaranteed and polygamous or plural marriages are forever prohibited. Article IV declares that both male and female citizens shall enjoy equally all civil, political and religious rights and privileges, and that every citizen of the United States of the age of 21 and upward, who shall have been a citizen for 90 days, and shall have resided in the State one year, four months in the county and 60 days in the precinct prior to an election, shall be entitled to vote thereat, excepting idiots, insane persons and unpardoned persons convicted of treason or crime.

Legislative.— The legislative power is vested in a senate and house of representatives with biennial sessions in odd years, senators to be elected for four years and representatives for two years and all to be at least 25 years old. Till otherwise provided the senate will consist of 18 members and the house of representatives of 45 members; but the senators shall never exceed 30 in number and the representatives shall never be less than twice nor greater than three times the number of senators.

Executive.— The executive department includes a governor, secretary of State, State auditor, State treasurer, attorney-general and superintendent of public instruction. A candidate for the office of governor or secretary of State must be at least 30 years of age and have been a resident of Utah for the five years preceding the election. The State auditor and State treasurer are ineligible to election as their own successors. The governor is vested with authority to veto objectionable items in a bill appropriating moneys, while approving other portions, and to veto any measure passed by the legislature, which veto, however, may be overcome by a two-thirds vote of both houses. In case of his death, impeachment, removal from office or inability to perform the duties of his office, they devolve upon the secretary of State.

Judiciary.— The judicial power is vested in the senate sitting as a court of impeachment, in a Supreme Court of five judges, in District Courts, in justices of the peace and other inferior courts. Supreme Court judges are elected by popular vote for 10-year terms, judges of District Courts are elected for four-year terms.

Municipal and County.— The county is the unit of local government. Biennial elections for the election of local officials are held in even years for county and in odd years for municipal officials.

Manufactures.—Among many thriving industries may be mentioned the Provo Woolen Mills, the beet-sugar factories at Lehi, Ogden, Logan, Garland, Layton, West Jordan, Elsinore, Payson and Brigham; also the Inland Crystal Salt Works, the International and Highland Boy Smelters in Salt Lake and Tooele valleys and the electric-power plants at Salt Lake, Ogden, Provo and other places.

History.— The region of the Great Salt Lake was originally settled by emigration from the East. The pioneers were Latter-Day Saints or "Mormons," whose leader, Brigham Young (q.v.), led a company of 143 men, three women and two children from the Missouri River to Salt Lake Valley in the spring and summer of 1847. Prior to that time these people, owing to religious and political differences between them and their neighbors, had migrated from several States, including Illinois, where their prophet, Joseph Smith, was killed by a mob in June 1844. He was a native of Vermont and of Revolutionary ancestry, as was his successor, Brigham Young, the second president of the Latter-Day Church. Leaving the main body of his followers living in wagons and log huts upon and near the Indian lands in western Iowa, President Young conducted his pioneer company across the great plains and mountains, the journey beginning at Winter Quarters (now Florence, Neb.) early in April and ending in Salt Lake Valley 24 July 1847. This journey would have been undertaken a year earlier, but for a call made by the Federal government upon the expatriated people — a call promptly met — for a battalion of 500 men, to assist in the war against Mexico. The pioneers were well armed and equipped and carried with them, in covered wagons drawn by ox and mule teams, plows and other implements, a surveying apparatus, seed-grain and a year's supply of provisions.

The great West, now teeming with populous cities and thriving villages, connected by railroad, telegraph and telephone, was then a wilderness, almost unknown, not only to the people of the East, who had heard of it through romantic tales or imperfect reports from Spanish and American explorers, but also to the straggling fur hunters roaming over its immense solitudes, baiting the bear, trapping the beaver, trading and consorting with the savages and acting as guides for the occasional emigrant train or chance traveler to or from the Western Ocean. Every schoolboy familiar with the map of North America knew something about "The Great American Desert," as this region was popularly termed. One of the fur hunters, Col. James Bridger, living in a lonely log fort near the headwaters of Green River, met President Young and his party just after they passed the Rocky Mountains, and endeavored to dissuade them from settling in Salt Lake Valley. Bridger remarked pessimistically that he would give a thousand dollars if he knew an ear of corn could ripen here. Nothing daunted, the pioneers pursued their way, and reaching the alkaline shores of "America's Dead Sea," they laid out Salt Lake City, the parent of numerous towns and hamlets that have since arisen from the waste, as Utah's gift to civilization.

The earliest of these settlements formed the nucleus of the inter-mountain empire. To the founders of this Commonwealth, more than to any other people, owing to their unity, communal spirit and systematic methods is due the redemption of arid America. They were the Anglo-Saxon pioneers of irrigation. President Theodore Roosevelt, in a public speech delivered at Salt Lake City in May 1903, credited Utah with being the Gamaliel at whose feet the Federal government had learned valuable, practical lessons before passing the National Irrigation Law of 1902, by which the government proposed to co-operate with the people of the Rocky Mountain and Plain States in extending and building up a system of irrigated agriculture. The first fruits of that enactment, in this State, was the completion, in May 1916, of

the Strawberry Valley Reservoir and Canal, which tunnels the Wasatch Mountains and brings upon many thousands of dry acres in Utah Valley the waters impounded for this purpose eastward of that rocky range. Since 1847 over $20,000,000 have been expended upon the principal irrigation enterprises; 500 reservoirs have been built, 6,000 miles of main canals constructed and 2,000 miles of laterals.

As early as 1832 a few American emigrants had settled in Oregon, which then included Washington, Idaho and other parts, and was claimed both by Great Britain and the United States. A little later a thin stream of emigration began crossing the country from the Missouri River to California, then a Mexican province including the present States of California, Nevada and Utah. But none of those emigrants settled here. All shunned the desolate valley by the lake and hurried on to the green and fertile slopes of the Pacific. The Utah pioneers might have done likewise, had not their sagacious leader foreseen the very probable result — a repetition of the troubles they had fled from in Ohio, Missouri and Illinois. Hence his refusal to be influenced by one of his prominent lieutenants — Samuel Brannan, who, after piloting a ship's company of Latter-day Saints from New York around Cape Horn and to the Bay of San Francisco, and leaving them to plow and sow, build adobe houses and set up a newspaper in the San Joaquin Valley, came overland to meet the pioneers and persuade them, if possible, to forego their half-formed design of locating in the desert basin, and instead to join the Brannan colony on the California Coast. "No," said Brigham Young, "this is the place." Here, accordingly, they settled — here upon alien soil, the acquisition of which by the United States was an immediate result of the Mexican War, in which the Mormon battalion participated.

The pioneers planted their first crops immediately upon entering Salt Lake Valley. The ground was parched and burning and more than one plowshare was broken in the hard sun-baked soil, afterward softened and made arable by turning upon it the waters of the mountain streams. They also constructed a log and mud fort, as a means of protection against hostile Indians. This done, most of the leading men returned to the Missouri River for their families. Those who remained in the mountains were reinforced in the autumn of 1847 by several large companies of immigrants, who had followed them from the frontier. The aforementioned, with a small company of Latter-day Saints from Mississippi, who joined the pioneers at Fort Laramie, and the returned members of the Mormon battalion, which had been honorably discharged at Los Angeles, were the colonists who struck the first blows in the founding of Utah.

February 1848 witnessed the signing of the Treaty of Guadalupe Hidalgo, ceding to the United States the provinces of New Mexico and California. In March 1849, at Salt Lake City, was organized the provisional government of Deseret, pending Congressional action upon a petition for a State government. Congress denied this petition and organized, with greatly reduced boundaries from those of the proposed commonwealth, the Territory of Utah, destined also to be diminished in size by the formation of subsequent States and Territories. The Organic Act was signed by President Millard Fillmore 9 Sept. 1850, but the news did not reach Utah until late in January 1851. Early in February the Territorial government went into effect. One of the first counties was named Millard, and its principal town Fillmore, in honor of the nation's head, by whom Brigham Young had been appointed governor.

The first 10 years of occupancy passed in comparative peace. There were wars with the red men, in which the settlers were uniformly victorious, not more by force of arms than by wise diplomacy which summed up their Indian policy in these words: "It is cheaper to feed the Indians than to fight them." The savages were gradually placated, and became peaceable and friendly. There were also seasons of drought and years of famine, before irrigation prevailed over aridity, and the swarming crickets and grasshoppers that devoured the early crops ceased their terrible visitations. The work of colonization was vigorously pushed, settlements being formed wherever a spring of water bubbling up from some oasis in the desert, or the smallest stream flowing from the mountains, held out hope of agricultural success.

Immigration was systematically carried on by the Latter-day Saints, intent upon their ideal of gathering scattered Israel from the nations. The Perpetual Emigrating Fund Company, organized in the autumn of 1849, sent annually to the frontier 500 wagons to bring the poor to Utah. Those aided by, were expected to reimburse, the fund, thus making it perpetual. Many of these immigrants, men, women and children, walked the entire distance from the Missouri River, some of them pulling handcarts over burning plains and storm-swept mountains. During the season of 1856 many perished. Various classes of people — farmers, laborers, tradesmen, mechanics, merchants, manufacturers and business men, with a liberal sprinkling of artists, musicians, writers and other professionals, were to be found in these wagon trains. The newcomers, wherever possible, would practise their trades or professions, but all were encouraged to take up land and build permanent homes. Small holdings were the rule. There was neither land nor water for speculative purposes. Utah has at the present time 23,000 farms, averaging about 150 acres each. Nearly half a million acres have been entered for cultivation under dry-farm methods, requiring no irrigation.

Wherever settlements sprang up, they were upon soil claimed by the Indians and acquired by the United States at the close of its war with Mexico. The nation was expected to deal with the Indians, and in due time with the settlers, but until it took steps in this direction, the people could obtain no title to their homes. Much anxiety was felt by them in consequence. Twenty-one years passed after the settlement of Salt Lake Valley before the United States land laws were extended over this region. While waiting for the national government to dispose of the soil, the provisional government made temporary grants to its citizens of the lands they occupied.

Toward the close of Governor Young's sec-

ond term there was some friction between Utah and the general government, caused by reports of a rebellion in this Territory. Investigation proved the rumors groundless, and a peaceable adjustment followed. The troops sent to put down the supposed insurrection were commanded by Gen. Albert Sidney Johnston, who afterward led a Confederate army and fell at the battle of Shiloh, 6 April 1862. As the commander of the Utah Expedition (1857–58) Johnston was opposed by the Utah militia under Gen. Daniel H. Wells, acting under orders from Governor Young, who had proclaimed Utah under martial law. No blood was shed but Johnston's army passed the winter outside of Salt Lake Valley. Spring brought peace commissioners from Washington, and the trouble was soon over. The Hon. Alfred Cumming, Utah's first Gentile executive, was welcomed to Salt Lake City, and it was he who reported to the government that the United States court records, which the Mormons had been accused of burning, were found intact and in a state of complete preservation. General Johnston founded Camp Floyd, 40 miles south of Salt Lake City, and there the troops remained until the outbreak of the Civil War, when the post was abandoned.

An event of great importance to Utah was the establishment of the Pacific telegraph line, built from both east and west and completed to Salt Lake City in October 1861. Up to that time the fastest means of communication between the Missouri and the Pacific were the stage-coach and the pony express, superseding ox team and pack mule. The first message that went over the wire from Salt Lake City was signed by Brigham Young and contained the significant words: "Utah has not seceded." This telegram was to President J. H. Wade, of the Pacific Telegraph Company, Cleveland, Ohio. A similar message was sent to President Lincoln by Acting-Governor Frank Fuller. Lincoln answered, congratulating the Territory and its people. In April 1862, he requested ex-Governor Young to raise, arm and equip a company of cavalry to protect the overland mail route and telegraph line against Indians and other enemies of the government. The response was hearty and immediate. Nevertheless a suspicion that Utah was disloyal induced Secretary of War Stanton to establish a military post in the vicinity of the Utah capital, ostensibly to hold the Indians in check, in reality "to keep an eye on Brigham Young and the Mormons." Colonel Connor and the California and Nevada Volunteers, who had enlisted for service in the East, were assigned, much to their chagrin, to this needless vedette duty. It was October 1862 when they founded Fort Douglas, already mentioned. These troops made themselves useful in subduing hostile Indians, and for his gallant service in this direction, Connor was given a brigadier-generalship.

The Pacific Railroad, pushing from Omaha westward and from Sacramento eastward, found the Mormon settlements directly in its path, and was promptly aided by Utah men, who came forward with their means and helped to construct the great highway. Brigham Young, who was a Union Pacific director, took a contract from that company and built nearly 100 miles of its roadbed through the Wasatch Mountains. The Central (now Southern) Pacific also had Utah contractors. And thus was exploded the popular fallacy that the Mormon people were opposed to this mighty enterprise. As a matter of fact, the governor and legislature of the Territory had petitioned Congress for the construction of such a railroad as early as March 1852. When Utah's delegate presented this memorial in the House of Representatives at Washington, he was told that he was 100 years ahead of the age. In reply he invited the members of Congress to come over the road when completed and visit him at his home in Salt Lake City. Twenty years later some of them actually did so.

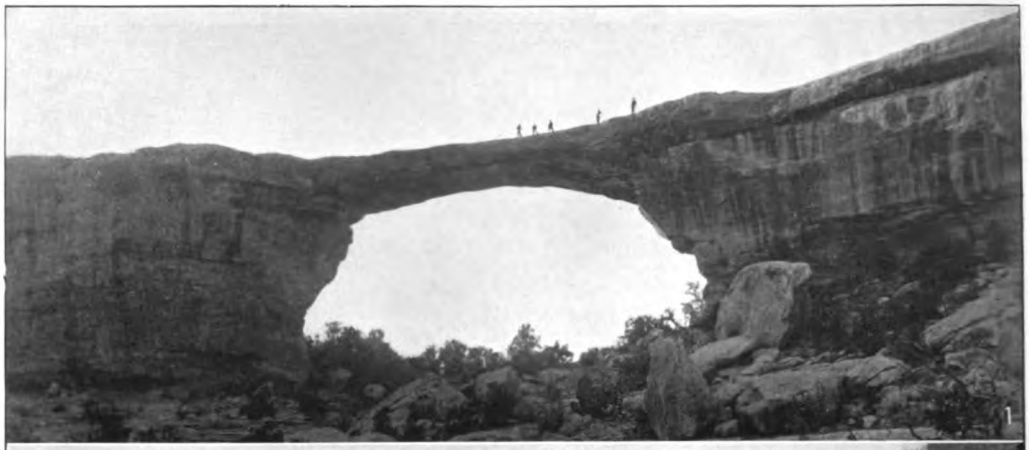
The meeting of the Union Pacific and Central Pacific lines at Promontory, Utah, 10 May 1869, was an occasion of general rejoicing. The point of junction was soon moved to Ogden, 40 miles north of Salt Lake City, and between these towns was built by home capital, in 1869–70, the Utah Central, the first local railroad, with Brigham Young as its president. A similar line south of the capital immediately followed. These roads, with others subsequently constructed, were absorbed by the Union Pacific, which held an unbroken monopoly of the railroad business in Utah until March 1883, when the Denver and Rio Grande was completed to Salt Lake City.

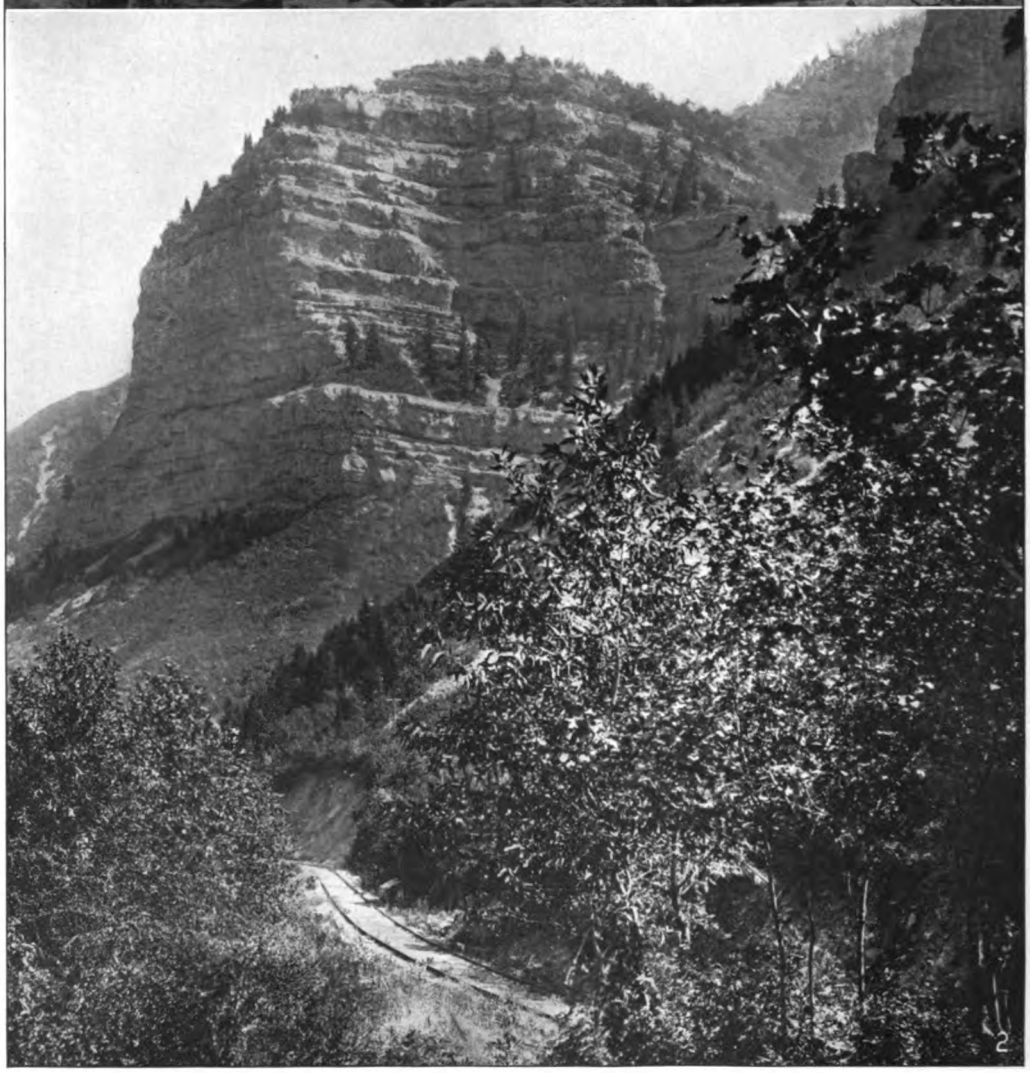
Utah's earliest merchants, outside the Mormon community, and excepting Captain Grant, of Fort Hall (Ida.), representing the Hudson Bay Company, were from the East. Livingstone and Kinkead, a Saint Louis firm, freighted a large stock of merchandise across the plains in the autumn of 1849. Goods were also brought from southern California. During the early days of money scarcity, exchange and barter was the rule — the dry goods and groceries of the merchant for the products of farm, orchard, mill and workshop; the latter utilized at home or converted into cash in distant markets. The first settlers coined California gold dust and made and used paper money until the national coins became sufficiently plentiful. The greatest commercial enterprise that Utah has known — Zion's Co-operative Mercantile Institution — was organized in October 1868, the object being to unify the interests of the old settlers in the face of unfriendly competition. This great house is still in existence though no longer an exclusively Mormon institution. It has an annual trade of over $6,000,000.

Many changes resulted from the coming of the railroad. Population and capital poured into Utah; the mines, hitherto unprofitable, began to pay; railroads and telegraphs were extended, manufactures established and an impetus was given to trade and industrialism in general. The *Deseret News*, the pioneer journal of the Rocky Mountains, established in June 1850, soon had two powerful rivals, the Salt Lake *Herald* and the Salt Lake *Tribune*, the former independent, the latter anti-Mormon in tone. The *Tribune* was the mouthpiece of the Liberal party, between which and the People's party a long and bitter fight was waged, a period of friction between Mormon and Gentile, strongly reminiscent of the historic feuds of Guelph and Ghibelline. Churches and schools also multiplied, supplementing the work of those already established, both secular and

Courtesy of Salnsbury-Siddoway Photo. Co.

State Capitol at Salt Lake City





1 The " Edwin " Natural Bridge, Southeastern Utah. One of the group of three great arches in this part of the State, San Juan County. Reached from Thompson, Utah, or Mancos, Colorado, on the Denver & Rio Grande. Height, 104 feet; thickness at top of arch, 10 feet; width of top of arch, 35 feet; width of span, 194 feet; height of span, 88 feet

2 In Provo Canon, Utah, on the Denver & Rio Grande Railroad

parochial. All these, with the State University, founded in February 1850, and the old district schools, now merged into a splendid free school system dating from 1890, have placed Utah in advance, educationally, of most of the States in the Union. The percentage of illiteracy for native whites is 0.4, and for the entire population, including foreign born, but 2.5.

Brigham Young, the founder of Utah, dying in August 1877, was succeeded as head of the Mormon Church by John Taylor. During the latter's administration the Federal government, by its courts and prosecuting officers, began proceedings for the suppression of plural marriage, commonly called polygamy, which had been a tenet of the Mormon faith since July 1843, when Joseph Smith introduced it in Illinois. Never at any time did more than 3 per cent of the Latter-day Saints practise it. All, however, or practically all, believed it a divine institution, the restored marriage system of the Hebrew patriarchs, eugenically designed, under strict moral regulations, for the production of a superior race. Some of the best men and women in the community assumed its obligations, and did so with the worthiest motives, from a profound religious conviction. Plural marriage was not the Oriental polygamy of modern times. The harem or seraglio was unknown. Plurality of wives constituted the "polygamy" or "many marriages"—this being the definition of that somewhat misleading term. Each wife had a separate home, with her own children around her, and, as stated by Capt. Howard Stansbury, who conducted a government survey of the Great Salt Lake in 1849-50 (consult 'Stansbury's Expedition'), the plural wife stood "in the same relation to the man as the wife that was first married," the union thus formed being "considered a perfectly virtuous and honorable one."

But the government, influenced by popular religious prejudice, set its face against this peculiar institution, and under legislation enacted by Congress in 1862, 1882 and 1887, polygamists were rigorously prosecuted; the result being the eventual relinquishment of the inhibited practice, out of deference to the laws of the land. This, however, was not until nearly 1,000 persons had been fined and imprisoned for infractions of those statutes, aimed as they believed at "an establishment of religion," with which Congress, by the constitution of the United States, was forbidden to interfere. In addition to those who suffered fine and imprisonment, many more were driven into exile, President Taylor himself dying in that condition. Moreover, the Church property, amounting to nearly $1,000,000, was temporarily confiscated—forfeited and escheated to the government. Not until the special laws enacted against this feature of their faith had been thoroughly tested and pronounced constitutional by the court of last resort would the Latter-day Saints yield the point; so strong was their conviction—a conviction shared by many outside the Church—that those laws violated the rights of conscience and were an infringement upon religious liberty. But the final decree having been uttered, the Church bowed in submission and agreed in General Conference, October 1890, that no more plural marriages should be solemnized under its sanction.

The Church has been true to its pledge. While there have been some cases of new polygamy since the Mormon president, Wilford Woodruff, issued the "Manifesto" prohibiting plural marriages, they were of a sporadic nature and entirely unauthorized, the individuals involved being alone responsible. The Church repudiates their acts, and as fast as the offenders have been discovered and proved guilty, it has dealt with them by disfellowshipment and excommunication.

The issuance of the manifesto was followed by an era of better feeling between Mormons and Gentiles. Utah had long been a battleground, torn by dissension and ill will between these two classes of her citizens. They now "buried the hatchet" and mingled socially, politically and in business as never before. Dropping old feuds and abandoning local alignments, the members of the People's and Liberal parties reorganized as Democrats, Republicans, etc., and began to work unitedly for the common weal. Presidents Harrison and Cleveland, in successive proclamations, granted general amnesty to all polygamists; the confiscated Church property was returned; and everything done that a great and generous government could devise to cause the unpleasant past to be forgotten. As an appropriate capstone to the temple of peace thus reared, Utah, on 4 Jan. 1896, was admitted into the Union as a State. The Republicans elected the first officers of the new Commonwealth.

Not the least gratifying spectacle witnessed during the years that followed was that of Mormon and Gentile youths, sons of sires who had built up the State, enlisting together and standing shoulder to shoulder, fighting the battles of their country during the war with Spain. The record made by the Utah Volunteers in the Philippine Islands, in Cuba and elsewhere is a page of history of which the American army can well be proud; and the same is true of "the boys in khaki" from this State who served in the Great War of 1917-18. Throughout this broad land, no people are more loyal to the flag, the constitution and the government than are the people of Utah.

The Present Status.—Utah, with her 28 counties, containing 124 cities and towns, has a collective population of 429,191, less than a third of which is found in Salt Lake City, the capital of the State. While the principal occupations of the people are farming, stock-raising, mining and manufacturing, the learned professions and the fine arts have many representatives among them. The average death rate is but 10.8 to the thousand; that of the whole United States being 16.5. The bonded debt in 1914 amounted to $3,360,000. The assessed valuation of property of all kinds at the present time (1919) is $540,500,000. Most of the inhabitants of the State are Mormons, though the Gentiles predominate at Salt Lake City, at Ogden and in all or most of the mining towns. From 1905 to 1911 the Utah capital was governed by the American party, an anti-Mormon political organization, virtually a revival of the Liberal party. Its rule was not satisfactory, however, and in 1904 a fusion of Gentile and Mormon citizens overthrew it at the polls. Since then the commission form of government has controlled Salt Lake City.

GOVERNORS OF UTAH.

STATE OF DESERET.

Brigham Young	1849–51

TERRITORIAL GOVERNORS.

Brigham Young	1851–57
Alfred Cumming	1857–61
Francis H. Wootten (acting)	1861
John W. Dawson	1861
Frank Fuller (acting)	1861–62
Stephen S. Harding	1862–63
James Duane Doty	1863–65
Amos Reed (acting)	1865
Charles Durkee	1865–69
Edwin Higgins (acting)	1869–70
S. A. Mann (acting)	1870
J. Wilson Shaffer	1870
Vernon H. Vaughan (acting)	1870–71
George A. Black (acting)	1871
George L. Woods	1871–74
S. B. Axtell	1874–75
George B. Emery	1875–80
Eli H. Murray	1880–86
Caleb W. West	1886–89
Arthur L. Thomas	1889–93
Caleb W. West	1893–96

STATE GOVERNORS.

Heber M. Wells	Republican	1896–1905
John C. Cutler	"	1905–09
William Spry	"	1909–17
Simon Bamberger	Democrat	1917–

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ORSON F. WHITNEY,
Author of 'Whitney's History of Utah.'

UTAH, a lake in the State of Utah, in Utah County, about 30 miles southeast of Great Salt Lake. It is about 25 miles long from north to south and from 3 to 13 miles wide; area, 150 square miles; altitude, 4,500 feet. It is the largest body of fresh water in the State. It is in a valley formed by the uplift of mountain ranges; on the east the Wasatch and on the west the Lake, Oquirrh and Tintic. The streams which enter the lake come mostly from the Wasatch Range. The outlet of Utah Lake is Jordan River, which flows into Great Salt Lake.

UTAH, Agricultural College of, the State agricultural and mechanical college, founded in accordance with the Land Grant Act of 1862; located at Logan, Utah. The college is a part of the public school system and is open to both men and women. It was chartered in 1888 and opened to students in 1890; in 1901 the curriculum was considerably enlarged and an extra year's work required for entrance to the collegiate courses leading to a degree. In 1903 the college organization was made more complete and effective by the establishment of five schools — the school of agriculture, the school of domestic science and arts, the school of agricultural engineering and mechanic arts, the school of commerce and the school of general science; in 1904 a department of music was added, offering courses in vocal music, pianoforte, violin and theory of music. The courses offered by the various schools of the college are as follows: (1) Four years' courses in agriculture, home economics, commerce, mechanical engineering and general science, leading to the degree of B.S., in agriculture, etc.; (2) three years' courses of vocational grade in agriculture, home economics and commerce. There are also short winter courses in agriculture, in home economics and mechanical arts. The State Experiment Station is connected with the college and offers opportunity for advanced work. The institution is organized on the quarter system, being thereby in practically continuous session.

UTAH, University of, the State university is located at Salt Lake City. It was incorporated as the University of the State of Deseret in 1850 and opened to students in that year. But as it failed to secure patronage or adequate financial support, it was closed after one session until 1867. The governing board of regents, however, maintained their organization during this time and had general supervision of the public school system. When first reopened in 1867 it was largely a commercial college, but in 1869 was reorganized with normal and classical departments. In 1894 a new charter was obtained, the name was changed to University of Utah and a 60-acre tract of land on the Fort Douglas reservation was granted to the university by the Federal government. In the same year the Salt Lake Literary and Scientific Association gave $60,000 for the endowment of a chair of geology. In 1899 the legislature provided for the erection of new buildings and the removal of the university to the new site, which was first occupied in 1900. Subsequent to this the government granted the university land so that its campus was enlarged to 90 acres. The board of regents consists of the president of the university and the secretary of State, members ex officio, and 12 members appointed by the governor for four years. The university is open to both sexes on equal terms. The organization includes the school of arts and sciences, the school of education, school of mines and engineering, school of medicine, school of law, school of commerce and finance, the extension division, the graduate division, and in connection with the school of education the university high school, elementary training school and kindergarten. The schools of arts and sciences, education, commerce and finance offer courses leading to the degrees of B.A. and B.S. The graduate division offers courses leading to the M.A. and M.S. The school of medicine offers at the present time the degree of B.S., in medicine, which is granted after the student has completed two years of premedical work and two years of professional work. The premedical and junior courses leading to a degree in dentistry as well as a four-year course leading to

the B.S., in pharmacy are also offered. The school of law offers courses leading to the LL.B. The school of mines and engineering offers courses in mining and engineering leading to a degree of B.S. The senior college of the school of education grants the teachers' high school diploma and the junior college elementary and kindergarten diplomas, which are all legal licenses to teach in the public schools of the State. Scholarships and fellowships are offered to graduate students in metallurgy and chemistry in the school of mines and engineering. The university calendar is based upon the quarter system, which permits of a summer quarter of 12 weeks, which is largely attended by students from other States on account of Salt Lake's ideal climate. The campus is situated at the base of the Wasatch Mountains, overlooking the valley of Great Salt Lake and Salt Lake City. In 1919 there are 19 buildings on the campus. The valuation of the physical plant of the university is estimated at $1,208,000. The library of the university is the largest in the State of Utah and contains 53,819 bound volumes and 20,728 pamphlets. The principal bequest received during the year 1918 was $50,000 for the benefit of the school of mines and engineering from the estate of James MacGregor, Terre Haute, Ind. The total number of students in the year 1917–18 was 3,732. The faculty numbers 147.

UTAHLITE, a compact, green variscite found in nodules near Lewiston, Utah. They have been sliced and polished and make charming specimens. Wardite is a frequent associate. See VARISCITE.

UTAKAMAND, oo-tą-ką-mŭnd, or **OOTACAMUND,** India. See OOTACAMUND.

UTAMARO, oo'tą-mä'rō, **Kitagawa,** Japanese artist: b. Kawagoye, 1753; d. 1806. His work became widely known and his prints are well represented in the Metropolitan Museum, New York. Among his most famous series are 'The Twelve Hours of the Green Houses' (1804). Consult the monograph by Goncourt (Paris 1911).

UTE, ūt. See SHOSHONEAN INDIANS.

UTERUS. See WOMB.

UTICA, ū'tĭ-ką, N. Y., city, county-seat of Oneida County, on the Mohawk River and the Erie Canal and on the New York Central and leased railway lines, the West Shore, etc., the Delaware, Lackawanna and Western and the Ontario and Western railroads, about 80 miles west of Albany and 50 miles east of Syracuse. Electric lines extend to surrounding villages and towns. The railroads extending north cross the Adirondack region and connect with the steamers on the Saint Lawrence and with the trunk lines of Canada. The railroads to the south connect with the Erie and some of the lines in Pennsylvania. The large number of passengers who transfer at Utica, "the gateway to the Adirondacks and the Thousand Islands," make it one of the most important stations between New York and Buffalo.

Manufacturing and Commerce.— The chief manufactures are hot-air furnaces, hosiery and knit goods, men's clothing, machine-shop products, steam fitting and heating apparatus, lumber products, marble products, paving material, foundry products and tobacco products. In 1914 there were more than 300 manufacturing establishments listed by the census, with an annual production of over $30,000,000. In 1918 the local manufactured products were estimated at fully $40,000,000 and 17,000 persons were on the factory pay-rolls. The city is famous for the excellence of its woolen, cotton and knit goods and its hot-air furnaces. Utica ships large quantities of manufactured goods, farm products, fruit, dairy products and livestock. It is a distributing centre for an extensive region extending north and south. It is an important cheese market and large quantities of flowers, especially roses, are shipped to New York.

Buildings and Improvements.— The principal public buildings are the Government building, State armory, city hall, Y. M. C. A. and Y. W. C. A. buildings, public library, Munson-Williams Memorial building, churches, schools and business blocks. The altitude of the city is about 505 feet and the slope is sufficient to make a surface drainage. The sewer system is excellent. The water plant is owned by a private corporation which has a paid-up capital of $500,000. The reservoir has a daily capacity of about 4,010,000 gallons. There are a number of small squares and several parks. The streets are wide, paved largely with asphalt and kept clean. Forest Hill cemetery in the suburbs contains the mausoleums of Roscoe Conkling and Horatio Seymour.

Churches and Charities.— There are over 50 churches, the leading denominations being Roman Catholic, Protestant Episcopal, Methodist, Presbyterian, Baptist and Lutheran. The charitable institutions are the Utica State Hospital, the Masonic Home of New York State, Saint Elizabeth's Hospital and Home, Saint Luke's Homœopathic, Faxton and City hospitals, Home for the Homeless (for aged women), Home for Aged Men and Couples, Saint John's Orphan Asylum, Saint Joseph's Infant Home, Utica Orphan Asylum and the City Orphan Asylum. The Woman's Christian Association and other organizations do noble work for the relief of the needy.

Education.— The educational institutions are three high schools, the public school academy, founded in 1843, the Balliol School (Utica Female Academy), the Utica Catholic Academy, 22 ward schools, a teachers' training school, several parish schools, a public free library of 60,000 volumes, libraries connected with each of the three high schools and libraries connected with some of the literary societies. Hamilton College (q.v.), at Clinton, is only nine miles distant from Utica and is reached by steam and electric cars.

Banks, etc.—There are eight banks and one trust and deposit company, three daily and numerous weekly and monthly newspapers.

Government.— The government is vested in a mayor and a council of 15 members, who hold office two years. The administrative officials are appointed by the mayor, subject to the approval of the council, or are elected by the council.

History.— The original settlement was called Old Fort Schuyler, from a fort which had been erected here during the French and Indian War. It was named in honor of Col. Peter Schuyler. The territory on which Old Fort Schuyler was located formed part of a

tract of 22,000 acres, granted 2 Jan. 1734 by George II, king of England, nominally to several persons, but in reality to enure to the benefit of William Cosby, colonial governor of New York and New Jersey. In 1786 a survey of the manor of Cosby, together with a map of the same, was made by John R. Bleecker. It appears therefrom that two houses were located near the fort on which is now the east side of Genesee street, and one house on land on the west side. Improvements had been made a little farther westward, somewhere between the present lines of Broadway and State streets, and other improvements in the eastern part of the city. Outside of these evidences of civilization was a vast unbroken forest. The occupant of the house nearest the river, on the western side of the road, was John Cunningham, and his nearest neighbor, on the same side, was George Damuth. The resident on the opposite side was Jacob Christman. The settler toward the west was a man named McNamee, and the clearings on the eastern border were designated as those of McNamee and Abraham Boom. It is not known which one of these men came first. Before that time Old Fort Schuyler was an advantageous place of trade between the outlying settlements and the Indians, as there was here a fording place across the Mohawk River and the old Indian path from Oneida Castle here intercepted the path along the river side leading to the portage of Fort Stanwix (now Rome). In 1798 the village was incorporated under the name of Utica, and in 1832 was chartered as a city. Consult 'Outline History of Utica and Vicinity' (Utica 1900): 'Publications' (Oneida Historical Society).

Population.— The population of Utica in 1910, 74,419; 1915, 80,589.

UTICA, North Africa, an ancient city 17 miles northwest of Carthage; originally founded as a Phœnician colony in 1101 B.C. During the Third Punic War, Utica submitted to Rome, and became the capital of the province of Africa. Afterward it was the see of a bishop, till its destruction by the Arabs about 700. Its ruins include an amphitheatre, an aqueduct and the remains of quays, formerly connected with the sea, now nearly 10 miles distant, by the ancient river Bagradas, the course of which has since diverted to the east.

UTICA SLATE, a black, somewhat carbonaceous and silicious clay slate (*Carbonaceous argillutyte*) prominently developed in the Mohawk Valley of New York State, and deriving its name from the outcrops in the vicinity of Utica, N. Y. It is also recognized in the Champlain Valley, and in the northern Appalachian region, but beyond these localities their beds are represented by more calcareous or silicious shales and arenytes. These shales rest upon the Trenton limestone and are succeeded by the more arenaceous Lorraine beds. The chief fossils of the Utica slates are the trilobite *Triarthus beckii* and graptolites of the genus Diplograptus. See ORDOVICIAN.

UTILITARIANISM, a term first employed by John Stuart Mill, in a philosophical sense, to denominate a theory of morals that had already been formulated by the Greeks, but which reached its fullest development in England during the latter part of the 18th and the beginning of the 19th centuries. Mill tells us that he adopted the word from a passing expression in Mr. Galt's 'Annals of the Parish.' His definition of the term is as follows: "The creed which accepts as the foundation of morals utility or the Greatest Happiness Principle, holds that actions are right in proportion as they tend to promote happiness, wrong as they tend to produce the reverse of happiness. By happiness is intended pleasure, and the absence of pain; by unhappiness, pain and the privation of pleasure. To give a clear idea of the moral theory, much more requires to be said: in particular, what things it includes in the ideas of pain and pleasure; and to what extent this is left an open question. But these supplementary explanations do not affect the theory of life on which this theory of morality is grounded—namely, that pleasure and freedom from pain are the only things desirable as ends; and that all desirable things (which are as numerous in the utilitarian as in any other scheme) are desirable either for the pleasure inherent in themselves, or as means to the promotion of pleasure and the prevention of pain."

Utilitarianism in England was not merely a philosophical doctrine during the first third of the 19th century. This theory of morals furnished the basis for a political and social propaganda. Of this movement Jeremy Bentham, James Mill and his son, John Stuart Mill, were successively leaders, and its objects were distinctly radical and reformatory. The *Westminster Review* was founded in 1824 as the organ of the new radicalism, and proved of great influence in exposing abuses in the Constitution, in existing legislation and in the administration of justice. Bentham's most important work was in the field of legislative reform, while the Mills, father and son, who were better instructed in philosophical principles and possessed broader interests, upheld the cause of freedom and progress as well in social, economic and religious matters. The best account of this movement, which had very important practical results, is found in Leslie Stephen's 'The English Utilitarians' (1900).

It is with utilitarianism as a theory of morals, however, that we are here most directly concerned. The doctrine that pleasure is the end of life, which is at present usually denominated hedonism (q.v.), was first formulated by the Cyreniacs, and in a somewhat more developed form by Epicurus. In modern times this doctrine is found in Hobbes, who assumes that mankind is essentially egoistic, each individual seeking naturally what is of advantage to him. Although most of the English ethical writers of the 18th century refuse to accept the conclusions of Hobbes, they generally find difficulty in explaining why the happiness of other men should be sought by the agent, since they assume with Hobbes that it is a natural psychological principle that each seeks his own happiness. The tendency and obligation to seek "the greatest happiness of the greatest number" (an expression first employed by Cumberland) is either explained as a result of the psychological principle of association, or by taking refuge in a refined egoism through a demonstration that it pays to have regard to the happiness of others. That mankind is moved by genuinely altruistic impulses, that it is as natural to promote the

good of our neighbor as to seek our own advantage, was perhaps first clearly stated by Butler in his 'Sermons on Human Nature.' Neither Bentham nor Mill, however, provides any adequate way of passing from the psychological principle, "each man naturally seeks his own pleasure," to the ethical doctrine that "happiness of all should be sought by each individual." This latter principle, nevertheless, is that which the Utilitarians assume as the basis of their moral theory. Among the more important English Utilitarians are Cumberland, Hume, Gay, Paley, Bentham, James Mill, John Stuart Mill and Herbert Spencer, who unites Utilitarianism with evolutionary theories.

The end of life, according to the Utilitarians, is, as we have seen, happiness. The theory thus insists that the moral quality of an act is determined by its consequences — an act being good that promotes happiness or prevents unhappiness, and wrong when it operates in the reverse direction. It is accordingly directly opposed to Intuitionism (q.v.), which declares that there is some natural quality in acts which constitutes them good or bad in themselves, and that this moral quality can be directly known without any reference to consequences. Thus an Intuitionist would say that lying is bad in itself and is directly perceived to be such, while the Utilitarian would find that its moral quality is determined by its results to the individual and to society. As we have seen, happiness means pleasure, and the avoidance of pain. The question arises whether anything more than the quantity of pleasure is to be considered in judging the morality of an action. Bentham and the older Utilitarians maintained that everything depends upon the amount of pleasure resulting from an act: "the quantity of pleasure being equal, push-pin is as good as poetry." John Stuart Mill, on the other hand, introduced the concept of qualitative differences in pleasures. "It is quite compatible with the principle of utility," he says, "to recognize the fact that some kinds of pleasure are more desirable and more valuable than others. . . . Of two pleasures if there be one to which all or almost all who have experience of both give a decided preference, irrespective of any feeling of moral obligation to prefer it, that is the more desirable pleasure. If one of the two is, by those who are completely acquainted with both, placed so far above the other that they prefer it even though knowing it to be attended with a greater amount of discontent, and would not resign it for any quantity of the other pleasure which their nature is capable of, we are justified in ascribing to the preferred enjoyment a superiority in quality, so far outweighing quantity as to render it, in comparison, of small account." This doctrine of a qualitative difference in pleasures doubtless is borne out by experience, and consequently is a practical advantage to the older Utilitarianism. But the objection has frequently been raised that to rank pleasures as higher or lower, irrespective of their quantity, is logically to abandon the utilitarian position. For it appears that it is only by introducing some other standard than pleasure itself that this graduation is possible. The Epicureans and the older Utilitarians had showed that pleasures of the mind, for example, were preferable to pleasure of the body by using the quantitative standard — that is, by showing that on account of their constancy, permanence, and the fact that they entailed no subsequent pain, they really exceeded the latter in quantity.

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UTILIZATION OF POWER. See POWER, UTILIZATION OF.

UTOPIA. Probably nothing illustrates better Lowell's description of a classic as "a commentary on the morning paper" than the fact that Sir Thomas More's 'Utopia,' published just 400 years ago, discusses practically all the important social problems that we are most occupied with at the present time. Almost at the beginning of the book modern penology, that presumedly latest awakening of the social conscience, is introduced with the principle "For if you suffer your people to be ill-educated and their manners to be corrupted from their infancy and then punish them for their crimes to which their first education disposes them, what else is to be concluded from this but that you first make thieves and then punish them." This is, however, only one phase of the law of practical correction as laid down; for in Utopia they had the indeterminate sentence, prisoners were not housed in a hardening environment, they worked outside and earned their livelihood, being restored to liberty only upon report of a good character. Above all justice was fostered and the thief was bound to make restitution to the owner before his freedom could be secured.

The other most urgent community problems are anticipated as completely as those of penology. Eugenics was consulted by a premarital investigation; they accustomed themselves to daily military exercises but "engaged in war only to defend themselves or their friends from any unjust aggressors, or out of good nature, or in compassion to assist an oppressed nation in shaking off the yoke of tyranny." It would be hard to find a more striking comment on the morning paper than this. The Utopians enjoyed religious tolerance though they required their officials to believe in a hereafter of reward and punishment because they thought that added to responsibility. They believed money the root of evil, dispensed with its use, employed gold and silver for chains on their slaves (these were outcasts of other nations saved from a worse fate) and for slop jars and other necessary utensils.

In this model kingdom every one had to work six hours a day, three before and three after the mid-day meal. They dispatched their mid-day meal, but sat long at supper while music was played and entertainments were provided and the children were encouraged to exhibit their powers of memory and speech. They lived in model houses, each one with its garden where flowers had to be grown as well as vegetables and prizes were given to the most

successful gardeners. So as not to be spoiled by parental tenderness the children after early years were cared for by public authority. Their hospitals were so well built and organized «that scarce one in a whole town if he should fall ill would not choose rather to go thither than lie sick at home.» No wonder that the visitor to Utopia said of Europe as he saw it «therefore I must say that as I hope for mercy I can have no other notion of all the other governments that I see or know, than that they are a conspiracy of the rich who on pretense of managing the public only pursue their private ends.» . . . «The rich men not only by private fraud but also by common laws do every day pluck and snatch away from the poor some part of their daily living.»

The author of 'Utopia' was later to be one of the greatest of England's Lord Chancellors, the only one that ever cleared the docket of the Court of Chancery; and when the choice came between death or his conscience he accepted the alternative with a jest on his lips.

'Utopia' (1st ed), Louvain 1516; revised Frobenius, Basel 1518; first English translation Ralph Robinson, London 1551; translated also by Gilbert Burnett, 1684; Camelot edition contains sketch and More's other work 'The Pitiful Life of Edward V' besides 'Utopia' (London); Morley's edition (Burnett's translation), Cassell's National Library.

JAMES M. WALSH, M.D.

UTRAQUISTS. See CALIXTINES.

UTRECHT, ū'trĕkt (Dutch, ü'trĕht), Netherlands, the capital of the province of Utrecht, situated on the Old Rhine, where the Vecht branches off from it, 25 miles south by east of Amsterdam. It is a pleasant town with fine shaded promenades, and intersected with canals. The old fortifications are laid out in boulevards, but a double line of new forts surrounds the city. There are several very old churches, including the Gothic cathedral, built in the 13th century. The tower has a notable chime of 42 bells. Other notable buildings are those of the university, recently extended, the government building, the courthouse and the archives, formerly the palace of King Louis Napoleon. The university was established in 1636, and has a library of 200,000 volumes and a botanical garden. There is a meterological observatory and veterinary school. The industrial establishments include pigment factories, saw-mills, breweries, two organ factories, a number of cigar factories, an iron foundry, etc. The town is one of the most important railroad and canal centres in the kingdom. Utrecht is the oldest of the Batavian cities, and was called by the Romans *Traiectum ad Rhenum.* In 1579 the Act of Confederation of the Dutch provinces declaring their independence of Spain was signed here, and here the Peace of Utrecht was concluded in 1713 between the powers in the War of the Spanish Succession. The province lies between the Zuyder Zee and the Rhine. The northern portion is a dairy section; there is intensive agriculture along the Crooked Rhine and the southwest portion of the province is largely devoted to fruit-raising. The communal population is about 125,000; of the province 300,000.

UTRECHT, Peace of, the peace secured in 1713 through several separate treaties signed by France as one party and by Great Britain, Holland, Portugal, Prussia and Savoy on the other, later acceded to by Spain, supplemented in 1714 by the Treaty of Radstadt, between Germany and France, and by the Barrier Treaty of 1715 between Austria, Great Britain and the Netherlands. Its provisions terminated the War of the Spanish Succession and recognized Philip V of Bourbon as king of Spain, he to renounce all claim to the throne of France; Savoy received Sicily from Spain; Prussia was acknowledged as a kingdom, renounced her claim to Orange and was granted Neuchâtel and a portion of Gelderland; Austria received the Spanish Netherlands, Sardinia, the Milanese and Naples; the protection of Holland was secured by possession of certain fortified towns under the Barrier Treaty; and France recognized the Protestant succession in England, relinquished to her all claims to Newfoundland, Nova Scotia, Hudson Bay and Straits and Saint Christopher, West Indies, reserving fishery rights on the shores of Newfoundland and also confirmed England in the occupation of Gibraltar and Minorca, together with the privilege of supplying African slaves to America.

UTRECHT, Union of. In the evolution of the political life of the Low Countries, comprising the region which ultimately became the kingdoms of Belgium and the Netherlands, the most notable events were the establishment of the duchy of Burgundy (1384–1482); the act of Charles V in detaching the Seventeen Provinces from the German Empire (1543); the Pacification of Ghent (1576); the Union of Brussels (1577); and the confederation of the seven northern provinces by the Union of Utrecht, under John of Nassau. In the «Old Cradle of Liberty,» in 1579, the delegates met and formed a compact for mutual defense in 26 sections. This document has ever been regarded as the foundation of the Dutch Republic (1579–1814), of which the kingdom, with more freedom than in the old regimé, is but a development and disguise. While not a constitution, in the strict modern sense, this document served as such in the Dutch Republic of the United Netherlands for 215 years and was ever appealed to as the Xgrondwet» or fundamental law of all the component members of the federation. The common people and the Calvinists, when religion and politics were inextricably intertwined — for the Reformed Church was older than the State, or Republic, which had grown out of religion — considered that this Act of Union had made the people of the seven northern, or Protestant provinces, a nation (*natie*) and not merely impotent members of a political league, from which one of the signatories, even the Greatest Holland, could secede. They, therefore, opposed the ideas of state sovereignty, as held by Barneveldt and the Arminian party; and on this ground, even more perhaps than on questions of religious dogma, the politics of the republic, from 1581, when the Dutch abjured Philip II, and issued their declaration of independence, were colored and dictated. The National Synod was held and the Union and national ideas prevailed, though the era was disfigured by procedures common to the age. The issue raised between the stadtholder Maurice and the Advocate of Holland, John of Barneveldt, so un-

fairly stated by Motley, has been expounded voluminously by Dutch authors and is to this day the root and ground of political parties in the Netherlands. Consult Motley, 'The Rise of the Dutch Republic' (1855); Salmon, 'The Union of Utrecht' (1894); and the exhaustive serials of Dosker, 'Barneveldt: Martyr or Traitor?' (1898) in the *Presbyterian and Reformed Review.*

UTRECHT, University of, established in 1634 by the city and province of Utrecht it was closed during the French occupation (1762) and the Napoleonic conquest (1811–13) but was reopened two years later and has flourished since its opening as a royal university in 1815. It is divided into five faculties and has many laboratories and clinics. It has a library of 250,000 volumes. The average annual attendance of students is over 1,000.

UTRICULARIA. See BLADDERWORT.

UTSUNOMIYA, oo-tsŭ-nō-mē-yą, capital of Tochigi prefecture, which includes Shimotsuke province, on the railroad, 68 miles west of Tokio, formerly the seat of a powerful feudal lord and clan. It lies on the vast plain of the Kwanto, in sight of the Nikko range of mountains and has modern buildings. The castle site is now a park; five miles distant is the image of Kwannon, goddess of mercy, 60 feet high. This prefecture leads all in tobacco, hemp and copper; the mines of Ashio being the second largest in Japan, yielding $2,100,000 worth yearly. In manufactures, sericulture and weaving are foremost; the fabrics at Ashikaga being worth $5,000,000 a year. Pop. of the prefecture about 1,044,177; of Utsunomiya, 54,049.

UVALDE, ū-väl'dę, Tex., town, county-seat of Uvalde County, on the Southern Pacific Railroad, about 90 miles west of San Antonio. It is in an agricultural and stock-raising region and in the vicinity are asphalt mines. Cotton and honey are shipped. The chief industrial establishments are lumber mills, a flour mill and a machine shop. There are seven churches, separate public schools for white and colored pupils. There are two banks and a newspaper. Pop. 3,998.

UVANITE, a crystalline form of pitchblende.

UVAROVITE, a rare and beautiful emerald-green variety of garnet, distinguished by its content of chromium. It has a hardness of 7.5 and a specific gravity varying from 3.41 to 3.52. It is usually found in limestone or associated with chromite. Its most celebrated localities are the Ural Mountains and Orford, Quebec, where it occurs in groups of small dodecahedral crystals.

UVULA. See PALATE.

UXBRIDGE, ŭks'brĭj, Canada, a town of Ontario County, Ontario, on the Black River, and on the Toronto and Northern Railway, 36 miles northeast of Toronto. It has lumber and flour mills and manufactures iron ware, mill machinery, engines, agricultural implements, woolens, etc. Pop. about 2,000.

UXBRIDGE, Mass., town in Worcester County, on the Blackstone River, and on the New York, New Haven and Hartford Railroad, about 19 miles southeast of Worcester. Uxbridge was formerly a part of the town of Mendon; in 1727 it was separated and incorporated under its present name. In 1772 the northern part of the town was set off and incorporated as Northbridge. The town includes the villages of Calumet, Hecla, Rivulet, Scott's, Wheelock's, Uxbridge, North Uxbridge and Uxbridge Center. The chief industrial establishments are cotton and woolen mills, machine shops, a furniture factory and creameries. There are five churches, a high school, 17 district schools, a free public library. There are excellent banking facilities and newspapers. Pop. 4,671.

UXMAL, ooz'mäl, Mexico, an ancient Maya ruined city, in the northwest of Yucatan, about 60 miles southwest of Merida. It has vast remains of ancient grandeur, temples, cyclopean terraces, etc., extending over a large area. The principal ruins are the «Casa del Gobernador» and the «Casa de las Monjas.» The temples are said to have been used by the Indians as late as the 17th century. They date from the Stone Age and are among the most interesting archæological finds on the continent.

UZ, Syria, a historical region mentioned in the Old Testament as the scene of the story of Job and lying to the east or southeast of Palestine, probably in Hauran, the exact position not having been identified. Also a tribe presumed to have occupied this region and a traditional ancestor mentioned in Gen. x, 23 and xxii, 21.

UZANNE, ü-zän, **Louis Octave,** French writer and bibliophile: b. Auxerre, 14 Sept. 1852. He founded (1880) *Le Livre,* succeeded (1890) by *Le Livre Moderne.* In 1889 he founded the Société des Bibliophiles Contemporains. Among his works (translated titles) are 'The Caprices of a Book-Lover' (1877); 'Her Highness, Woman' (1884); 'Our Friends Books: Talks on Curious Literature' (1886); 'Modern Bindings'; 'Physiology of the Quays of Paris' (1890); 'The Bachelor's Prayer-Book' (1890); 'The Art and Artifices of a Beauty' (1902); 'Contemporaneous Egypt' (1909); 'Parisiennes of the Time' (1910).

UZZIAH, ŭ-zī'ą, or **AZARIAH,** king of Judah (792–740 B.C.). See AZARIAH.

V

V in the English alphabet, the 22d letter and the 17th consonant. V and U were originally one and used indiscriminately for the representation of the vowel *u* and the consonant *v* or *w*. The form V was derived by the Latins from the very ancient Greek alphabets, in which the Greek upsilon (Υ) was so written. In classical Greek upsilon always is a vowel, never a consonant. The classical Greek had no sign for the consonant V of the Latins: hence when a Latin word or name containing this consonant was transliterated into Greek the *v* was represented either by the digraph *ου* (*ou*) or by the letter *β* (which, in the Cyrillic alphabet and in modern Greek, represents the consonant *v*; examples: Lat. Varro, Gr. Ουάρρων; Lat. Virgilius, Gr. Βιργίλιος). Our *v* is a labiodental consonant; but our *w* is a labial only: which of these best represents the ancient Latin consonant V? The weight of authority among modern phonologists is in favor of the theory that the Latin consonant *v* was a labial differing but little, if at all, from our *w*. The English letter *v* is produced by the junction of the lower lip and the upper teeth: its sound differs from that of *f*, which is articulated in a similar way, in being voiced while that of *f* is breathed: they are both continuous consonants and both belong to the class of spirants. It is worthy of note that nearly all the words in English that begin with *v* are derived from French or Latin. V is never the final letter of a word in English, though the final *v*-sound is common, as in *live, thrive*. The name "doubled" was given to the character *w* in times before the specialization of the form *v* as a consonant sign only instead of being the sign of the vowel *u* also. English *v* may be derived from Indo-Germanic *bh* or from *p*. As an abbreviation *v* stands for vanadium, five or Latin *vide* "see." See the letter U, ALPHABET.

VACA, vä'kä, **Alvar Nuñez Cabeza.** See NUÑEZ CABEZA DE VACA, ALVAR.

VACA DE CASTRO, vä'kä dā käs'trō, **Cristóval,** Spanish jurist and administrator: b. 1492; d. 1562. A member of the audience at Valladolid, he was sent in 1540 to Peru to advise with Pizarro regarding the government and in case of the latter's death himself to assume power. On his arrival at Popoyan he received word of Pizarro's assassination and the revolt of Almagro. Aided by Alonso de Alvarado and others of Pizarro's principal captains, he defeated Almagro at Chupas 16 Sept. 1542 and had him executed at Cuzco for treason. He retained the government until the arrival of the viceroy Blasco Nuñez Vela early in 1544, when he was imprisoned on suspicion of conspiring against the "New Laws." He escaped to Spain where he was imprisoned in 1545–56 on charges from which he was finally exonerated.

VACARESCO, vä-kā-rĕs'kō, **Helene,** Rumanian writer: b. 1866. She was educated at Paris and Bucharest. Her 'Chants d'Aurore' was crowned by the French Academy and her 'Rumanian Ballads' received from the French Academy the prize Jules Favre. She is the author also of 'Kings and Queens I Have Known' (1904); but her most famous work is 'L'Ame Sereine,' which brought her a prize from the French Academy in 1896. In 1909 she published 'The Adventures of Two Empresses.'

VACATION SCHOOLS. See SUMMER SESSIONS.

VACCINATION is a process of transmitting by inoculation a specific disease known as vaccinia, cowpox, or modified smallpox from one susceptible reagent to another — either from animal to animal, from animal to man, or from man to man. Nearly all the warm-blooded animals are susceptible to vaccinia, but they may vary considerably in such susceptibility; in some it is slight, only affecting a certain tissue, as the cornea; while in others it may affect the cornea, skin and mucous membranes. The term vaccination also is used in a broader sense, and is made to apply to other diseases than vaccinia. It may denote the process by which other disease-producing agents are inoculated into a susceptible species in such a way as to render it refractory to a given disease contracted in the natural way. The sole purpose at the present time in inoculating vaccinia into a susceptible reagent is for the purpose, primarily, of rendering it insusceptible to the disease smallpox, and the propagation, continuation and multiplication of the specific material.

History.—To properly appreciate the subject of vaccination and its beneficent effects in the suppression and control of the much-dreaded disease, smallpox, it will be necessary to review briefly some few incidents of its early history. Credit is due to Edward Jenner (q.v.), a physician living in the western part of England, for its discovery and application. The subject of the protective effect of vaccination contracted by persons who had been milking cows which were suffering from an eruptive disease, known then as cowpox, attracted Jenner's attention even when a pupil. On the completion of his medical studies and return to Berkeley, the idea was ever dominant in his mind; and as soon as opportunity offered, he began to make his observations and investigations of cowpox. But facts which were so convincing to his own mind he evidently feared as unacceptable to his medical brethren, and so he made his ideas known to

only his friend Gardner, to whom he writes: "I have entrusted a most important matter to you, which I firmly believe will prove of essential benefit to the human race. I know you, and should not wish that what I have stated be brought into conversation; but should anything untoward turn up in my experiments, I should be made, particularly by my medical brothers, the subject of ridicule." In 1788 he brought his observations and theory before the medical profession, but did not make any impression, save in one instance. A colleague, acting upon Jenner's suggestion soon after its announcement, inoculated a child with cowpox matter and afterward with smallpox virus. It did not have the smallpox. For the next eight years Jenner was patiently pursuing his observations, collecting data regarding cowpox and its transmissibility to persons, and particularly noting its protective effects against smallpox. In May 1796, he issued his celebrated treatise entitled 'An Enquiry into the Causes and Effects of the Variolæ Vaccinæ, a Disease Discovered in Some of the Western Counties of England, Particularly Gloucestershire, and Known by the Name of Cowpox.' It attracted no little attention. The majority of the medical profession, and many of the intelligent laity, appeared now to be ready to accept his conclusions, and eager to apply his method. His position was, however, not an enviable one. True, letters came from all parts of the world asking information about his discovery, how the material could be obtained, etc., to which he willingly and readily responded so far as he was able. On the other hand, notwithstanding its ready acceptance, he was beset with troubles. There were not a few medical men who were unwilling to accept his discovery, and assailed him in every possible way by misstatements, misrepresentations and abuse. These he attempted to answer in a spirit of fairness and honesty. Later on, when the practice of vaccination became more general, his labors as "a vaccine clerk to the world," as he terms it, became less and less burdensome. He had the satisfaction of seeing his method adopted in nearly every civilized country. There were many, notwithstanding, who were loath, as some are even now, to abandon their fixed opinions as to its efficacy and resisted to the last.

Jenner's claim to priority of discovery has been subject to dispute, and the objection seems to be, in some particulars, founded on fact. There appears to be but little doubt that a farmer by the name of Benjamin Jesty, living in Downshay, Isle of Purbeck, was the first who is known to have practised vaccination. He inoculated his wife and two sons with matter taken from cows suffering from cowpox. All were affected. His wife's arm became very much inflamed and produced no small alarm in the family and no small sensation among his neighbors. Fifteen years after (1789), the sons, together with other persons, were inoculated with matter taken from a smallpox case, as was then the custom, to protect against the smallpox contracted in the ordinary way. None of those previously vaccinated with cowpox became ill with inoculated smallpox, whereas others inoculated passed through the several stages of the disease. There was a great prejudice against Jesty's experiments, and the people would have none of them. Jesty's remark was that for his part he "preferred taking infection from an innocuous animal like the cow, subject to so few disorders, than to take it from a human body liable to so many diseases; and that he had experience on his side, as casual smallpox was not attended with dangers like the variolous infection, and that besides there appeared to him little risk in introducing into the human constitution matter from the cow, as we already, without danger, eat the flesh, drink the milk and cover ourselves with the skin of this innocuous animal." Also, there is recorded that a Holsteiner, by the name of Plett, inoculated three children with matter taken from the udder of a cow suffering with "cowpox" using his pocket knife to make the insertion. All the inoculations were successful; later when smallpox appeared all had the disease but these children. On an examination of Jenner's papers, it seems that he makes no claim as to priority, simply recording his own observations and giving in detail his experiments to support the theory that smallpox can be prevented by vaccination. He also proves that the prevailing opinion shared by the milkers, that cowpox contracted by them was protective against smallpox, was founded on fact. Had it not been for Jenner's brilliant, painstaking work, replete with accurate observations, in all probability Jesty's inoculations would have been lost, and a long time might have elapsed before the beneficent discovery of vaccination would have become known. The principal conclusions of Jenner's discovery may be summarized thus: (1) That vaccinia or cowpox casually induced in man renders him insusceptible to smallpox. (2) Only the specific agent of vaccinia or smallpox, and no other eruptive disease of the cow, has this power. (3) Cowpox may be induced at will from cow to man. (4) That engrafted cowpox may be continued indefinitely from man to man, conferring on each in succession insusceptibility to smallpox, the same as could be produced by inoculation of the virus direct from the cow to man.

Origin and Distribution of Vaccinia or Cowpox.— Vaccinia in the cow is an eruptive vesicular disease, usually occurring on the teats and udder, sometimes on the muzzle and mucous membrane of the mouth and nose. It may occur in isolated instances, sometimes affecting one or only a few of the herd; at other times it may attack the whole herd. Its origin among cattle has been the subject of much dispute, some claiming that it always occurs spontaneously, citing as examples those isolated cases not infrequently met with, while others claim with equal positiveness that before an animal can have the disease it must contract it from some other source. The latter contention is more probable, as there is no instance of an analogy to the former existing in other infectious diseases. The contagion, therefore, must be transmitted in some manner to the animal, and its source must be either an animal or man having this disease. No other conclusion seems possible. It sometimes is met with occurring in horses, and is known as the "grease." Jenner demonstrated that the "horse grease" and cowpox were one and the same malady, and that matter taken from the horse could be transmitted to the cow, causing an inflammation and

symptoms identical with cowpox and, moreover, protecting equally as well against smallpox as does vaccinia. Bouley of Alfort has also made a study of the "grease" disease of horses, together with cowpox, and concludes that they are one and the same disease. In further support of the theory that the disease is transmitted to the bovine species largely through human agencies, it is a well-known fact that it is more frequently met with among milch cows than in either the heifers or males of the same herd. The reason for this is that the cowpox virus is transferred from cow to cow by means of the milkers' hands. The prevalence of cowpox appears to be in some way influenced by the seasons, more cases having been reported occurring during the spring months than at other times of the year. Suckling calves are also quite susceptible. It cannot be said, however, that vaccinia affects only cows, or the young calf, as all animals of the bovine species can be readily inoculated with the virus and the lesions caused by such inoculations are identical with those occurring "spontaneously." Jenner supplied many countries in his time with vaccine virus, originally from the cow, and subsequently propagated from arm to arm. The American stock of vaccine virus was introduced into the United States in either 1801 or 1802 by Waterhouse in Boston, and Hosack in New York, and at the same time in the Southern States through the interest of President Jefferson. Some of the strains were propagated for a long time by the arm-to-arm method. In Europe a strain of the original, received from Jenner in 1802, was still being propagated at Vienna as late as the 80's. The celebrated Beauagency stock, originating from a "spontaneous" case of cowpox in 1864, has furnished many strains. This was largely employed in France, Belgium, Germany and England, and was introduced in the United States in 1870 by Dr. Martin of Boston, just before the original was lost, during the siege of Paris. It is not known whether this particular strain is in existence at the present time. Many strains became so attenuated that they failed to cause the typical lesions and characteristic symptoms of vaccinia, and, most important of all, their protective property was very slight, if it existed at all. The result of employing such virus during what may be termed a pandemic prevalence of smallpox was that many persons who had been previously inoculated with it contracted smallpox. This made it necessary to abandon these weak strains for others of greater strength. Such experiences are not uncommon in the history of the vaccine virus, even as far back as Jenner's time. Jenner emphasized this point of the attenuation of the virus, and regarded it necessary to renew the strain from cases of cowpox wherever possible. Retro-vaccination, or inoculation of the cow with human virus, was often resorted to for the purpose of reviving the strain. The number of cases of natural cowpox have become exceedingly rare during the last half of the past century, only a few instances being reported from year to year, whereas in Jenner's time the disease was very prevalent. The fewness of the cases may be accounted for by the rarity of cases of smallpox at the present time, as compared with those of the past.

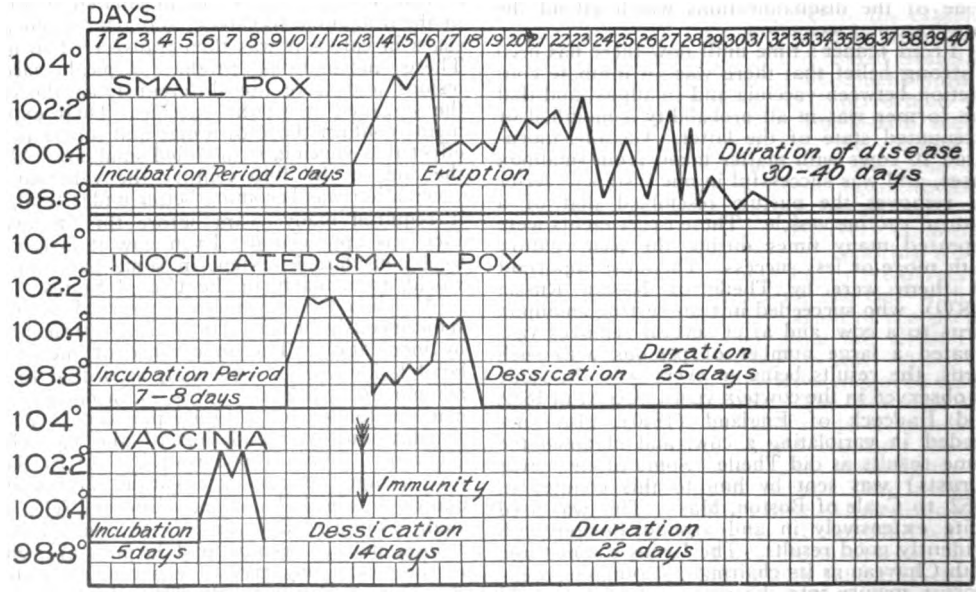
The inconvenience, as well as the disappointing results, following the use of humanized vaccine virus gradually resulted in the adoption of another method of propagating and furnishing the virus. One very prominent reason for this was the increasing fear of transferring a certain infectious disease from person to person through vaccination. Also, in transferring tuberculosis, Villeman's experiments regarding the possibility of such danger was given perhaps too much prominence. It cannot be denied that there is some slight possibility of the disease being transmitted in the process of vaccination. Unfortunately, there are cases on record where a grave constitutional disorder has been inoculated into healthy persons by vaccination. Those opposed to vaccination seized upon these accidents, and exploited them in every way possible, as a further argument against the control of smallpox by the arm-to-arm method, and as not an unimportant factor in reviving the method of propagating vaccine virus on the bovine species. This method was known to many, and was employed as early as 1800 in France, and by several physicians in Italy at various times between 1805 and 1840 — the latter by Negri in Naples, who began the systematic use of bovine vaccine virus. It then was employed to a slight extent in several places in Europe, but did not become of general use until many years later. Arm-to-arm vaccination was the method employed in the United States from the time of its introduction until as late as 1869, when animal vaccine virus began to be employed. It was not so difficult in our large cities to have available a supply of humanized vaccine virus, but with the growth and increase of the rural population it was not always an easy matter to have this supply; so in order to meet this growing demand, bovine vaccine virus was suggested as being the most practical method of overcoming the difficulty. This led to the establishment of "vaccine farms," as they were designated, in several parts of the United States. It was not long after their establishment until the bulk of the vaccinations were performed with the bovine virus, and the arm-to-arm method became the exception to the rule. When calf lymph came into common use, the same difficulties were apprehended with regard to its attenuation as were before noted with the humanized virus. Some observers claimed to have noted the good effect of restoring a virus beginning to show attenuation, by retro-vaccination — that is, by vaccinating the calf with the humanized virus and back again to the person; in some instances, alternating the virus from calf to man and from man to calf. Also, Calmette and Gurin of Lille have employed rabbits for producing the virus. The Bavarian government, as early as 1837, made it mandatory that this procedure should regularly be employed for revivifying and maintaining the potency of the vaccine virus. This brings us to consider the efficiency of the virus propagated through the bovine species, as compared with the humanized virus. There are many even to-day who contend that the results following the use of bovine virus are not so good nor so typical as those of the humanized virus. The reaction following the bovine virus is milder, the sore not so large nor typical. If we are allowed to form an opinion, from the descriptions of the early writers and their drawings of the vaccine

lesions, it must be admitted that they bear out to some degree the statements regarding what is now observed, and what used to be. Following its application, nearly every civilized country has adopted and employed the bovine virus. In some, vaccination is optional, while in others it is compulsory. Where vaccination is more largely employed, the frequency of attacks of smallpox diminishes in an equal ratio. Germany may be cited as an example, as a country which has employed the bovine vaccine to the greater number of its population than any other country. Vaccination here is made compulsory. All children during their first year are required to be vaccinated, and again at the age of 12. All males subject to military service are vaccinated on being drafted in the army (some 300,000 yearly). The official records for 1896 show that 1,518,793 were legally liable to vaccination; 1,321,348 were vaccinated with bovine vaccine virus, and 5,406 were vaccinated with virus of other sources. In primary vaccinations 96.77 per cent were successful. In secondary vaccination, made at the 12th year, there were 1,143,947 legally liable. Of these 1,107,025 were vaccinated with bovine virus and 7,165 with other virus; 91.71 per cent were successful. The wonderful immunity of the German nation to smallpox, resting entirely on its compulsory vaccination laws enacted in 1870, whereby the whole population has been vaccinated and revaccinated, not only demonstrates the benefits of vaccination *per se,* but also the efficacy of a virus obtained from the bovine species. Similar cases could also be cited to show the efficacy of the bovine virus. It cannot be said that the immunity conferred by it is any stronger or more lasting than that of the humanized virus, but it has all the advantages and none of the disqualifications which attend the arm-to-arm vaccination.

From Jenner's time until now there has been a strong belief that there was an intimate connection between vaccinia and smallpox, and that the former was in all probability a modified or attenuated state of the latter. Gassons inoculated 10 cows with matter taken from smallpox cases, and was successful in one instance. After 10 removes the pustule resembled that of a natural vaccine vesicle. These experiments were repeated many times during the past century with more or less success. The most important of them were by Theile of Kasan, Russia (1839), who succeeded in transferring smallpox virus to a cow, and after several removes vaccinated a large number of persons with such virus, the results being in every way the same as observed in the cowpox virus. Ceely, in 1839, and Badcock of England (1840), also succeeded in variolating a cow, and obtained the same results as did Theile. Some of this virus (crusts) was sent by him to this country in 1852, to Coale of Boston, Mass. This was used quite extensively in and around Boston with evidently good results. The Lyons commission, with Chaveau as its chairman, also made an extensive inquiry into the nature of vaccinia and smallpox. Some of its experiments were in this particular direction. Chaveau's conclusions were that vaccinia was separate and distinct from smallpox, and although the smallpox virus could with great difficulty be transferred to the bovine species, producing lesions closely resembling those of vaccinia, on subsequent passages through other animals it became attenuated and finally inert. Voigt, of Hamburg, in 1881, also succeeded in transmitting the smallpox virus to a calf, and after several passages employed it for vaccinating persons. This particular strain has been employed by Voigt for all the vaccinations performed in Hamburg from 1881 to 1904, the virus being propagated directly from calf to calf, with an exception that on two occasions (1891) it was passed from calf to man, and then in 1902 from calf to rabbit. The results obtained from the employment of this strain are such as to be convincing proof of its potency during all these years, as the percentages of successful vaccinations in primary cases, ranging from 98 to 100 per cent, and the low percentage of successes in revaccination, 69 per cent, demonstrate the permanency of immunity. The most convincing proof lies, however, in the fact that the population of Hamburg shows fewer cases of smallpox than any other community of same size. The preponderance of evidence accumulated during the past century shows that vaccine is nothing more or less than a modified and attenuated form of smallpox. The latest researches on this subject, as set forth at length by Pfeiffer, Guarnieri and Wasielewski, and of those in particular by Councilman and his co-workers on the specific organism of smallpox and vaccinia, seem to leave but little doubt as to their common nature. Brinkerhoff and Tyzzer made an extensive enquiry in Manilla in 1904 into the nature of smallpox and vaccinia, in which they show that smallpox is transmissible to monkeys and orangutan; and that the inoculated smallpox behaved in no wise different from the inoculated smallpox in man. Further they succeeded in transmitting this inoculated smallpox of the orangutan to calves; and after a few passages in calves it was then transferred to man. These inoculations produce typical vaccine lesions and were not different from those of the so-called "cowpox" vaccine. Their experiments confirm those of Voigt and others to the effect that vaccinia is modified smallpox. About the end of the 19th century the value of revaccination was becoming better understood, but it required many years before this important fact was appreciated. Even now it is ignored to a considerable extent in some parts of the world, particularly in the United States.

Vaccinia has never been observed to occur spontaneously in man. It is always transmitted by inoculation. The appearance of the inoculated lesion varies somewhat, according to the manner in which the virus is inserted. The usual methods are: (1) By puncture. (2) By scarification or denudation of the epithelium (abrasion). (3) Hypodermically. If by puncture, a slight redness occurs at the point of inoculation within 24 hours, not different from any slight wound of the skin. In 48 hours a slight redness may be seen around the puncture, which to the touch may give a sensation of a slight elevation of the spot. At 72 hours the spot is visible, slightly elevated, slightly gray in the centre and surrounded with the faintest suggestion of a pink border or areola. In 96 hours the papule is of a dull whitish color, the border elevated and well outlined. There is usually a depression of the centre — umbilicated, the

areola is well marked; the skin around it is hard and begins to be painful and itch. From the fifth to the sixth day the process still further enlarges and varies from one-fourth inch to one-half inch in diameter. The centre is darker and more depressed, the periphery much more elevated and the edges of a pearly gray color. The sore is filled with a fluid, the areola is of a darker color, the skin just beyond this is softer and less painful. About the seventh day the vesicle becomes flatter, though somewhat wider, the centre not so much depressed but covered with a crust or scab. The gray zone becomes yellowish and the areola and induration diminished. From this time onward the process gradually subsides, the crest or scale becomes thicker and more elevated, gradually contracts, and after 15 or 18 days falls off and leaves a completely healed pink and glistening surface, with small, dark depressions here and there over its area. If the inoculation is made by scarification or incision the same phenomena are observed, save that the process is hastened and is fairly well marked on the second day, with incipient but distinct areola; the central depression, with a distinct gray, pearly margin, elevated and prominent. The areola and induration are well marked on the fourth day, the gray centre is vesicular and transparent, its external margin irregular; the central depression is quite marked, the areola a bright pink and the surrounding skin is swollen. The lesion now advances more rapidly during the next 24 hours, when the clear vesicular zone becomes a whitish color, its borders irregular, the central depression darker and covered with a crust. The areola is not now so prominent nor the induration so diffused. It has now reached its maximum development and gradually subsides, healing from the 15th to the 18th day. When the virus is inserted by the hypodermic method, and the needle passed into the skin, the appearance of the lesion is much the same as in that by simple puncture, but sometimes there is no lesion development of the skin proper. Instead there is a slight induration beneath it, which to the touch imparts a feeling of a small shot. This gradually enlarges until the fifth or sixth day, when it soon subsides. The constitutional symptoms in man are practically the same as those occurring in the animal. There is an elevation of temperature, loss of appetite and thirst and more or less enlargement of the glands nearest to the lesion, which reaches its greatest increase at the height of the development of the pustule. If there is no secondary infection of the lesion by extraneous bacteria the temperature falls to normal, the sore heals and all symptoms rapidly subside. In some very susceptible subjects, particularly in children, vaccination is sometimes followed by a secondary vaccinal eruption. This may be a discreet crop of vesicles occurring at or around the point of inoculation. Sometimes, however, a general eruption may follow. This second crop will go through practically the same phases of development as does the original puncture, only that it is smaller and the individual vesicles have not the same amount of areola and induration of skin as observed at the site of inoculation. The local lesions of inoculated smallpox and vaccinia are quite distinct. So also are the constitutional symptoms. In smallpox there is a period of from 12 to 14 days intervening between the exposure to the disease and the appearance of the first symptoms. In inoculated smallpox the period of incubation is much shorter, seven to eight days, before the fever and rash. In vaccinia the incubative period is from five to six days. The difference between each can be illustrated in the following temperature chart (after Hime):


DAYS
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40
104°
102·2°
100·4°
98·8°
SMALL POX
Incubation Period 12 days
Eruption
Duration of disease 30-40 days
INOCULATED SMALL POX
Incubation Period 7-8 days
Dessication
Duration 25 days
VACCINIA
Immunity
Incubation 5 days
Dessication 14 days
Duration 22 days

Recovery from smallpox requires from 30 to 40 days or more; if inoculated, smallpox, 25 days, and for vaccinia, 22 days. The limit given for each is for the time required for the individual to completely recover from the disease. Does recovery mean simply that the in-

fective agent has completed the cycle of its development, and then ceases to exist, or that it is influenced or brought under subjection to certain substances in the body of the host? It is a well-established fact that recovery from any attack of smallpox usually protects the individual against a subsequent attack. So also does vaccination protect against subsequent inoculation, and also protects against smallpox. There is beyond question a change occurring in the body in some way which prevents it again becoming a susceptible reagent to these poisons, a state of resistance or immunity. Some experiments of Sternberg show that the blood of a vaccinated calf, when mixed with a quantity of vaccine virus, destroys its activity. The writer has also observed this. It was found that these substances begin to make their appearance in the blood of a vaccinated animal about the ninth day, and are at the height of their potency at about the 14th day, after which they gradually disappear. Even when these substances (antibodies) have disappeared, the animal will remain for a long time refractory to vaccination. It, therefore, seems more than probable that two states of resistance are brought about by vaccinia, one in which the vaccine virus is destroyed by these new substances, and that the body cells have in some manner been so modified that they are no longer in a receptive state to the virus. The same train of reasoning would seem to apply to the state of immunity following an attack of smallpox. The time when the tissues become refractory to the vaccinal process has been established by observation both on man and animals. If an animal be vaccinated over a small spot of the skin in successive days, the vaccinated process will develop normally on the first, second, third, fourth, fifth and sixth days; that on the seventh day will show an under development; the eighth day still more so, and the ninth only a slight trace, if any, and that of the 10th day not at all. The immunity is established about the ninth day and will continue for a period more or less long, and sometimes is permanent. Jenner has demonstrated that immunity to both smallpox and vaccinia is very strong, as persons having previously had the cowpox, even years before and subsequently vaccinated with fresh vaccine virus, and even inoculated with smallpox, did not contract the disease. The same also was established in Jesty's cases who were inoculated with smallpox virus without result a number of years after vaccination. Immunity to vaccinia can be produced in several ways. We have heretofore dealt with the method of inoculating the skin of mucous membrane and cornea with vaccine. The Lyons Commission, in 1877, demonstrated that a calf or horse could be rendered immune to vaccinia by injecting the virus either subcutaneously or intravenously, and after 9 to 14 days the animal would be refractory to a subsequent inoculation. Several years ago the writer made some experiments regarding this immunity, when conducting an enquiry into the serum therapy for smallpox, in which he confirmed all that had been claimed by the Lyons Commission, Chaveau and others. Not only was immunity established by intravenous and subcutaneous injections of the vaccine virus, but also a rapid immunity could be induced by injecting the virus under the dura mater, or into the brain substance. Monkeys could thus be rendered refractory to vaccinia within five days, whereas it could be caused in nine days when the virus was administered intravenously, or by inoculating the skin. It requires a very minute quantity of the virus, either in the form of lymph or pulp, to cause the typical lesion. Chaveau found that by taking lymph from a vaccine vesicle and diluting it as much as 1-20000th, it would cause a typical vaccine lesion. A general vaccinal eruption sometimes occurs in calves and young horses (colts) when a considerable amount of vaccine virus is injected in the veins, the eruption making its appearance about the fifth day, shortly after the fever. The eruption appears to be nowise different in appearance than that artificially produced by minute punctures. It also resembles the secondary eruption which occasionally follows vaccination in children. Vaccinia is chiefly confined to the tissues of the skin, but coincident to the development of the specific eruption the virus can also be demonstrated in the blood and the lymphatic glands, particularly those located near the point of inoculation. The blood, however, does not contain a very great amount of the virus, as it requires a considerable quantity, as much as 500 cubic centimeters (half a litre) to be inoculated applied to a scarified skin before it will cause a vaccine lesion. It has also been demonstrated to be present in the lymphatic glands, but it is not constant. The specific agent is to be found in these tissues only during the febrile state. Immunity can be conferred on other animals by transfusion of the blood during the febrile stage, provided a large quantity be given. It has been frequently noted that a certain train of symptoms frequently follow where vaccinations are done a second time. This is particularly so where the virus has been derived from calves. There is a local reaction at the point of inoculation which appears in about 24 hours after, the place becomes reddened and slightly elevated and is usually accompanied by an itching; there is a slight zone of congestion around it, and taken altogether, it has the appearance of a true vaccination. It subsides in a day or so. This is not a vaccination as was once believed, but is due to a reaction known as "anaphylaxis." It has nothing to do with the virus of vaccinia, but rather to the presence of the foreign protein of the calf serum or cells with which at some previous occasion the body cells have been sensitized.

Causes of Vaccinia.— Since the discovery of the disease many observations have been made from time to time on vaccinia, with a view to determining its specific cause. Nearly all such were made from a bacteriologic standpoint and numerous investigations have described various bacteria as being specific. Pfeiffer (1889) approached the subject in another way. He noted that smallpox and vaccine lesions contained bodies which, to all appearances, resembled that form of cell-life known as protozoa (a higher type than the bacteria), and later Guarnieri made a more comprehensive study of the lesions. He chose for his field of observation the cornea, where he was better able to observe the various changes occurring in the evolution of the vaccinal lesion, and in the life history of the parasite. He found that soon after the inoculation of the cornea with vaccine virus a

certain number of epithelial cells at the point of inoculation began to undergo a change. These cells began to show small round bodies which highly refract the light, lying in the protoplasm of the cell, are surrounded with a clear zone. These bodies are usually spherical and vary in size, some occasionally attaining the size of the nucleus of the cell, while others are minute points. They vary considerably in their shape and appear to be endowed with amœboid movements. The organism was protoplasmic, having no limiting membrane, nor does it contain a nucleus. The mode of production is by direct division. "The parasite has a circular evolution; it develops from around a central point — concentrically from within outward — hence the lesion of variola and vaccinia is circular" (Guarnieri). The announcement of this discovery excited no little interest among those who were devoting their attention to this subject. Since then much has been added to our knowledge regarding the nature of both smallpox and vaccinia. Guarnieri's work has been carefully reviewed by many, among whom that of Wasielewski has been of great service in bringing forward additional proofs, as well as adding no little to our knowledge of the parasite found in vaccinia and smallpox. He demonstrated beyond question that a parasite was always found in the epithelial cells of a vaccine or a smallpox lesion, that these parasites are never found in any other lesion, nor in the healthy tissues. Attempts failed to produce these in the cornea by inoculating it with material from skin scrapings, from measles, scarlet fever, chicken-pox, foot and mouth disease, bacteria or matter from non-specific postules on the teats and udder of the cow. Nor are such bodies present when irritating substances, such as cantharides, croton oil, silver nitrate, glycerin, osmic acid, India ink, or bacteria are applied to the cornea. Further, that if vaccine virus be deprived of its activity by filtration through porcelain, it loses its power to produce these bodies. Limited quantities of vaccine virus have been inoculated in the cornea of a rabbit and passed successfully from one rabbit to another for as many as 130. It would not stand to reason that any quantity of the original would be transferred to the animal last in the series, yet the lesion in the cornea is identical with the first, and the parasites are present in number, and have the same form and location in the cells. The filtration experiments also demonstrate that the bodies are larger than the bacteria, as virus subjected to this process loses its power of producing the vaccinal lesion. It would, therefore, appear that since these bodies are constantly present in the lesions caused either by smallpox or vaccinia, and are not observed in any other disease process, nor caused by physical or chemical agents, that they are actual parasites and are not simple changes produced in the cells by any other than these bodies. "The 'vaccine' bodies are the only characteristic structures which can be found in the skin mucous membrane in smallpox and vaccinia. They are absent in normal and other pathological conditions of the skin. These vaccine bodies appear with certainty and constant regularity when an actual vaccine virus is applied to a lesion of the skin or cornea." All attempts to cultivate the virus outside the body have so far been unsuccessful. It appears that the living body cells are required for its development. Some multiplication of the bodies have been observed to occur in the epithelial cell containing these bodies when the cell is placed under artificial conditions; but these have not been transmitted to other cells which have not been naturally infected.

All persons or animals of a given species do not contract vaccinia alike; some are quite refractory, and others so for the time being, but may be inoculated after repeated trials. In some the vaccinal lesion develops poorly, being small yet typical and is often delayed in its evolution. Instances like these are not infrequently observed where a group is vaccinated under practically the same conditions. Particularly is this so with animals used for the propagation of the vaccine virus. In those cases where the lesion is undeveloped, typical immunity, however, as a rule follows, and is more or less permanent. It is believed that such immunity is not so great as that following a fully developed lesion. The same insusceptibility to smallpox has also been observed. All persons exposed do not contract the disease, nor do all attacked suffer alike. However, those persons who resist the infection at first, if continuously or repeatedly exposed, will sooner or later succumb. It is a current belief that a successful vaccination confers a lasting immunity to smallpox. While a greater proportion of those successfully vaccinated are rendered refractory for a long time, there are some who will at some time or other contract smallpox. Such cases are, however, very rare. The most of them are among persons who have either been vaccinated in their infancy, or in whom vaccinal lesion was atypical. Vaccinated persons who contract smallpox, as a rule, have it mildly, running a shorter course, with none of the usual complications. This modified form is designated as varioloid. Immunity conferred by vaccination does not last as long as that following an attack of smallpox. It was once considered so, particularly during the time when arm-to-arm vaccination was practised. Jenner himself states that he deemed it advisable to revaccinate from time to time, in order to insure a full protection. It cannot be gainsaid that a single inoculation will be followed by a typical lesion, and that this will protect against smallpox, but for just how long it cannot be said. By comparison with the method of making multiple insertions (three or more), the cases of modified smallpox (varioloid) occurring among those vaccinated by a single insertion are found to be more frequent than among those vaccinated by multiple insertions. In Sweden the multiple insertion method has been practised for many years; the cases of smallpox are few, revaccination is not the rule. It would seem, therefore, that multiple insertions afford a greater protection than the single insertion. With regard to revaccination, two important facts are demonstrated: That many persons who were successfully vaccinated during infancy again become susceptible to vaccinia later, and that revaccination produces the strongest kind of immunity to smallpox. In Germany all children are required to become vaccinated during their first year and again between the 11th and 13th. The percentages

of successful revaccinations range from 69 to 91 per cent. The number of cases of smallpox developing are practically nil. There is no natural immunity to vaccinia any more so than there is a natural immunity to smallpox. The only immunity is a previous attack of smallpox or a successful vaccination. There may be a resistance of some degree which may vary with the individual, but repeated vaccinations will demonstrate their susceptibility by a successful vaccination.

Source of Vaccine Supply.—The usual method of obtaining a supply of humanized virus was to make two or more insertions on the arm, and when the lesions reached the vesicular stage, to open one or more of these vesicles; the serum was taken directly from the arm and transferred to another person, or it was preserved by drying on pieces of glass, ivory or threads. Some employed a small capillary tube, into which the fluid contents of the vesicle were drawn and the ends sealed in a flame or closed with wax. The usual custom, however, was to vaccinate direct from arm to arm; especially so was this in cities where vaccination was being done continuously. The dried crust, or scab, was also used, particularly by those who could not always obtain fresh material. These crusts were often active for several months, and there were instances in which they produced the typical vesicle even after a year or more. Great care was exercised in obtaining a crust from a typical lesion, and extra precautions were taken to keep this as dry as possible, it often being sealed in wax. At the present time humanized virus in any form is little employed, save in some of the Latin-American countries, where it is still the custom to use it; the bovine virus having superseded it in almost every civilized country.

The method of propagation and collection of the virus is in general the same in all countries. The animals are young calves from two to six months old, sometimes cows. Heifer calves are preferable on account of greater cleanliness of the vaccinated surface, although bull calves are frequently employed. Young camels, goats and water-buffalo calves are also used in some Oriental countries. Calves are selected as for their soundness and kept under observation for a few days, when they are cleansed by a bath of soap and warm water. Just before their vaccination an area of the skin, usually extending over the whole of the abdominal surface, is carefully shaven, cleansed again with soap and water, and then with sterilized water. Some operators apply some antiseptic, like trikresol, carbolic acid or corrosive sublimate, in disinfecting the skin, removing this with copious quantities of sterilized water. The shaven surface is then dried, and shallow incisions, just cutting through the outer layer of the skin (not drawing blood) are made with some sharp instrument. The incisions are made in long lines, or interrupted, so as to leave more or less healthy skin between them. The vaccine virus is then applied to these incisions and thoroughly rubbed in. The vaccine lesions begin to show on the second and third day, reaching full development between the fifth or sixth day. The most perfect method now in existence of propagating and collecting bovine vaccine virus is that employed by the Japanese government. Nearly all the virus supplied in Europe, Japan and the United States has glycerine added to it in different proportions for preserving it, as well as to eliminate the extraneous bacteria. Some is furnished in the dried form, especially in the United States, but the bulk of it is glycerinized. In nearly all European countries the production of vaccine virus is under state control, although there are many private establishments which also furnish it. Germany has 25 state vaccine stations, Holland 11, Denmark 1, England 1 and 9 or 10 private establishments, Sweden 1, France several private, Japan 2. In the United States there are 10 stations — three State and municipal and seven private. The State and municipal establishments are located as follows: Massachusetts 1, New York City 1, North Carolina 1. The private establishments are Pennsylvania 2, New York 1, Michigan 1, Indiana 1, District of Columbia 1, California 1. When compared with the distribution of these establishments in European countries, it will be seen at once that those in the United States are neither so numerous nor so advantageously located for supplying a virus to areas of equal extent, nor to the same number of population. In the former each vaccine establishment is supposed to supply virus to a certain territory, which is small as compared to the latter, and, moreover, the most important feature of such is that it is possible to supply a fresh virus quickly without the risk of deterioration incident to temperature and transportation over long distances.

Bacteria in Vaccine.—The many investigations made of the bacteria found in both the humanized and bovine virus are almost conclusive that they are in no wise connected with the specific cause of vaccinia. All vaccine virus contains many varieties of bacteria, some of these may be pathogenic, but the majority are harmless. Their origin may be from several sources from an antecedent virus, from the skin, from the alimentary tract of the vaccinated animal and from external contamination. Bovine virus usually contains the pus organisms, the staphylococcus aureus and albus, the streptococcus and in rare instances the tetanus bacillus. A vaccine virus may contain a great number of bacteria and yet be harmless; on the other hand only a few of the pathogenic varieties, and may cause serious consequences. As a rule the number of bacteria may be taken as an index of impurity resulting either from a faulty preparation, or not subjected long enough to the action of the glycerine. Any treatment to which the vaccine tissues are subjected, with a view to freeing it from the extraneous bacteria, influences its potency to a more or less degree. If glycerine be added, the number will gradually diminish. So in order to obtain the best results it usually follows that there arrives a time when such virus is free of bacteria, or nearly so, and when its potency is very little impaired. The Japanese have discovered that vaccine virus to which glycerine has been added, can be made to withstand considerable quantities of pure carbolic acid and in such strength as to kill the extraneous bacteria, and to do so without materially impairing its potency. Further, the vaccine virus can be produced bacteria free in certain animals, such as the male rabbit and calves, as has been suggested by Noguchi, but as yet this is in the experimental stage.

The preservation of the virus in a highly potent state is all important, it is quite sensitive to heat; the hot weather of the summer months causes it to deteriorate rapidly. Low temperatures on the other hand preserve it, and particularly is this so if the temperature is below the freezing point. Elgin of this country was first to discover this fact, which was confirmed by Green of England. Vaccine virus when subjected to very low temperatures and maintained thus with but little variation will remain potent for months, even as much as two years.

Vaccination.— The slight injury to the skin, necessary in inoculating with the vaccine virus, appears on first sight to be of such a trivial character that it is not always treated with the regard which is due it. Vaccination is, in the strictest sense, a surgical operation. No one at the present time would be willing to undergo a surgical operation, it matters not how slight it might be, unless he was convinced that it would be performed skilfully, and that all necessary precautions would be taken to insure its success. Vaccination is no exception, and due regard both for a successful inoculation and avoidance of complications must be kept in view. The following important points are to be considered: The condition under which the wound is made; the person vaccinated; the state of health; the peculiarity of temperament, and the conditions after vaccination. The inoculation can be made in any part of the skin, the site most preferable is on the outside and middle part of the arm just over the insertion of the deltoid muscle. The site selected for vaccination should at first be thoroughly cleansed with soap and warm water, then rinsed well with clean water, followed by the application of an antiseptic solution (1 per cent carbolic acid). The skin is then allowed to dry. When this is completed the site is ready for inoculation. Small scarifications of not more than one-fourth inch square are made with some sharp, sterile instrument, for example, a lancet or needle, to remove the outer layer of the skin, care being taken during the process not to make the scarification too deep. Blood should never be drawn. The vaccine is then gently rubbed into the wound and allowed to become thoroughly dry. It is not advisable to protect the wound with any dressing or substance which might adhere to it, as this is one of the most fruitful sources of septic infection. Nature has already furnished the wound with a covering which, if kept intact, will answer better than any artificial substance. The vaccinated places should be carefully protected against irritation, especially so when the lesion begins to assume the vesicular stage. It is then of the utmost importance to prevent its being injured. If, however, the vesicle is broken and there ensue severe local and constitutional symptoms, it is of importance that it be given surgical treatment. With a pure virus, vaccination, if carefully performed and given thorough attention after treatment, is practically without danger. Vaccination is sometimes followed with complications, the lesion being infected with pus organisms, giving rise to local abscesses; also septicæmia, pyæmia, erysipelas, gangrene and tetanus are occasionally observed. These may be conveyed by a contaminated virus, but are usually from the vaccination being improperly performed or from neglect of the wound. It has been estimated that as much as 70 per cent of the septic mischief is due to the injury of the vesicle taking place during the first and second week, the unsanitary surroundings or dirty habits of the patient largely contributing to complications. That these instances are of rare occurrence is borne out by the reports from the Imperial Health Office of Germany, which show that among 32,166,619 vaccinations of children there have been 115 deaths, 67 of these being in some way connected with the operation of vaccination. This gives a rate of a little over two per million, as compared with the thousands who die from smallpox. Sometimes a general vaccinia results. The eruption is to all appearances the same as the initial lesion, and runs a similar course. In addition to this there are post vaccinal eruptions, appearing from 10 to 14 days after. These may be a simple rash, a bullous eruption resembling pemphigus, impetigo, eczema and purpura. While these have no direct relation to vaccinia, their occurrence at this time is thought to be due to the vaccinia being the exciting and not the predisposing cause.

Statistics.— Some are inclined to criticise statistics concerning the protective effects of vaccination, and believe that these can be so manipulated that anything desired can be proven by them. When there is a death from smallpox, there can be but little doubt as to the cause of death, so if the deaths from smallpox be taken, a charge of manipulating statistics to suit the purpose would rest upon a slender foundation. The number of deaths caused by this disease, taken per million inhabitants, will, therefore, convey a very clear idea as to the rate among a population. London has records reaching as far back as 1629, and Geneva from 1580. In other countries, while the records are not so remote they are sufficient to give an idea of the prevalence of smallpox before vaccination. In England before vaccination, the rate was above 3,000 per million; in London it was over 4,000 per million. Now the rate is less than 20. In Prussia the rate before vaccination was slightly over 4,000, but on the adoption of vaccination it began to suddenly decline, and continued to do so until the vaccination law of 1874 was enforced, when the cases became fewer and fewer until now the rate is less than two per million. Sweden had a death rate from smallpox for 16 years prior to 1800, of 2,049 per million, while the rate from 1802 to 1811 fell to 623. In 1816 compulsory vaccination was enforced and for the next 10 years the rate was 133. From 1890 to 1889, 100 years after vaccination began to be practised, the death rate fell from 2,049 to 1.

Compulsory vaccination has been in force in France only since 1902, the rate of smallpox among the army being now four per 100,000, as compared with the experiences of 1870–71. Vaccination was introduced into Austria in 1808, and was optional until 1900, when all school children were required to be vaccinated before entering. Vaccination and revaccination are compulsory for the army and navy. Denmark since 1810 requires all children to be vaccinated before the seventh year. Revaccination is compulsory for the soldier and inmates of public institutions. Italy

has had compulsory vaccination since 1888. All children are required to be vaccinated within the first six months, and, if this is unsuccessful, to be revaccinated before they are a year old. Before the law was in effect the death rate of smallpox was 610 per million; in 1902, 9.7 per million. In Belgium and Holland it is not compulsory, although all public officials and the army are required to be vaccinated. In the latter, while not obligatory, all children must go to school and no child can attend without being vaccinated. The teachers also must be vaccinated. India prohibited smallpox inoculations in 1880 and made vaccination compulsory. Similar laws are in effect in Australia, New Zealand and Cape Colony. Vaccination is only optional in Russia, except in the army and the public service. The great majority of the people do not avail themselves of vaccination, so epidemics are not uncommon. In Persia, Siam and China little vaccination is done; therefore, smallpox is endemic. Japan has enforced compulsory vaccination since 1886, whereby the greater portion of the population has been vaccinated and revaccinated. Especially is this true of the population of large cities and on the seacoast. No provisions are made in any of the cities for smallpox hospitals proper. When a case develops it is usually allowed to remain at home, or taken to a general hospital for treatment. No quarantine measures of any kind are enforced. Notwithstanding this fact smallpox has never been known to spread from any such cases. The same also may be said with regard to the German empire, where no precautions are taken in the strict sense of the word against the spread of smallpox, the whole reliance being upon vaccination. It has been stated by those who opposed vaccination that the reason why the German empire was so free from smallpox was the superior facilities for the isolation and treatment of cases, and not vaccination. This was investigated by the Local Government Board to ascertain just what methods were employed by the government and municipalities for the prevention of smallpox. Accordingly, an agent was sent to make this investigation. He encountered serious difficulties from the very first. In Berlin he was informed by the Central Health Office that so far as it was known there were no smallpox cases in Germany. The principal cities of the four chief states of Prussia, Bavaria, Saxony and Würtemburg were visited. In 10 cities of these states, containing a population of over five million, or one-tenth of the population of the German empire, he did not find a single case. As a matter of history he ascertained that there had been 70 cases in seven years, 1895 to 1901 inclusive; in Cologne one case in 10 years; in Frankfort nine cases in 10 years; in Wiesbaden 12 cases 11 years ago, but none since then; in Mainz none during 11 years; in Munich seven cases in eight years; in Nuremberg none for about 11 years; in Dresden no deaths for the past 10 years; in Leipzig eight cases in eight years and in Stuttgart none in six years. Vaccination in the United States is not compulsory to the whole population. In many of the States and the District of Columbia all children of school age must be vaccinated, and those persons who have been exposed to smallpox. While vaccination is generally practised in nearly all the States there are large numbers of the population, particularly in the Southern States, principally among the negroes, who do not vaccinate. Among these smallpox is a common occurrence. The government requires all alien immigrants to be vaccinated before being allowed to land; also all persons of the army and navy. Further instances in statistics could be cited to show the protective effects of vaccination against smallpox if they were considered necessary. The only thing which seems to be lacking in our country is a compulsory vaccination law and a strict governmental supervision of the production of vaccine virus.

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JOSEPH J. KINYOUN, M.D.

VACCINATION, Opposition to. At all times since Jenner's discovery there has existed more or less opposition to vaccination. In England the antivaccinationists have been especially active and in that country the provisions of the Vaccination Acts have been largely rendered null through their efforts. Parents are now relieved of any penalty under the compulsory clauses of the acts if they offer proof that they have, within four months of the birth of a child, satisfied a stipendiary magistrate, or two justices in petty sessions, that they had conscientious scruples against vaccination and that they believed it would be prejudicial to the health of the child. In the United States and Canada opposition to vaccination has been sporadic and while not confined to any one region of East or West appears occasionally in many districts. On the Continent while some opposition has developed it has made little headway, the benefits from vaccination being the most effective answer to objectors. The basis of the arguments of these objectors has been at times almost ludicrous. In the early days of vaccination it was seriously alleged that vaccination caused bovine traits to develop in the child vaccinated, that hoofs, horns, etc., would tend to develop, and bellowing would replace speech. While present-day arguments against vaccination are less assertive and less naive than this they are equally without a sound scientific basis. The chief objections alleged

for a long period have been the complications resulting by other diseases being invaccinated. Some cases of syphilis appear to have been so invaccinated but such an occurrence could not have happened if the vaccinator had taken proper care. The calf lymph now in universal use effectively prevents the transmission of syphilis. Eczema and other skin eruptions so frequent in infancy often appear after vaccination, but it is safe to say that since these infantile evils would appear in any case their appearance is only hastened and not caused by vaccination. While some real dangers attend vaccination, when considered in relation to the extent of vaccination work done, they are insignificant. Better precautions and improvements in method from year to year are continually lessening these dangers, while the very real benefits accruing to millions rendered immune to the ravages of small-pox overbalance these attendant dangers a hundred times.

VACCINE. This term has undergone a change in meaning from that which it received at the hands of Jenner, the discoverer of vaccine inoculation for the preventive treatment of smallpox. This was a little over a hundred years ago and before the existence of modern bacteriology. Yet the principle which Jenner enunciated and which he but dimly and imperfectly understood is the same which in more recent years has been extensively elaborated by Pasteur, Koch and the entire great school of bacteriologists. It is the principle that by introducing into the animal body certain substances of known character, immunity or protection will be conferred for a longer or shorter period against the attack of disease-producing germs which may be within that body or which may subsequently gain access to it. A vaccine or vaccine virus, according to Jenner, was the contents of a pustule upon the skin, especially upon the udder of a cow or calf suffering with cowpox, which, when introduced into the lymph or blood circulation of a human being sensitive to smallpox, protected him in some way or other from that disease or arrested the disease if it was already in its incipient stage. A vaccine as understood by bacteriologists is a preparation composed of a great number of living attenuated bacteria or a smaller number of very virulent ones, or their products, including split bacteria, bacterial toxins and filtrates of fluid cultures. The reproduction of the bacterial cells is prevented by the use of a sufficient degree of heat, and the vaccine is preserved by the addition of a suitable antiseptic. Vaccines are conveniently prepared in the form of liquids which may be clear or turbid and with more or less abundant precipitate. Vaccines are used to prevent or cure diseases of many kinds by introducing them into the body through the mouth, the subcutaneous tissue, within the skin, within the substance of the muscles or directly into the blood circulation through a vein. The theory of vaccination presumes the presence within the blood of what are known as antibodies. Metchnikoff refers to them as phagocytes; they are also known as antigens. The antibodies are antagonistic to disease germs which have obtained access to the circulating blood. Their function is to attract some disease germs and repel others. When there is mutual attraction the germ is enveloped and absorbed by the antibody and the tendency to the disease of which the germ is the specific cause is thus limited and arrested. The object of the vaccine which is introduced into the circulation is to stimulate the healthy tissues to produce new antibodies and so increase the chance of destroying the invading disease germs.

It was not until 1874 that it was discovered by Traube that normal blood had bactericidal properties, this being followed by the important discovery of Behring that the serum of an artificially immunized animal may transmit immunity to other animals. This is called its bacteriolytic power and follows the injection into the animal of suitable bacteria. An injection of a suitable dose of vaccine into an animal is followed by a diminution of the bacteriolytic power of the blood, this being known as the negative phase of resistance. The larger the dose the more significant the clinical features of this stage, including rise of temperature and other physical disturbance. After this comes the positive phase when the antibacterial power of the blood and the resistance to bacterial influence are increased. By repeating these injections in increasing dosage the antibacterial and antitoxic power of the blood of the animals thus treated is increased for the disease germs against which the treatment has been directed. It is by this method of experiment, particularly in horses, that the antitoxin of diphtheria has been made available. One great merit in the use of vaccines as a therapeutic agent is that they are comparatively harmless, except in those who are in a weak and toxic condition from tuberculosis or some other infectious disease.

Vaccines are of various kinds. Autogenous vaccines are derived from cultures of bacteria obtained from the blood or discharges or secretions of one who is sick or injured and are injected into the same individual upon the theory that the stimulation to the development of antibodies will be greater than if the vaccine is obtained from an external source; they are of particular value in obstinate or unusual infections in which an exact diagnosis has not been made. Their production requires considerable time and is not available for very acute diseases. Stock vaccines are those which are made from representative types of particular organisms and are preserved for use according as those types are indicated as means of treatment; they are less costly to make than autogenous vaccines but are also distinctly less effective. The polyvalent form of stock vaccines contains different strains of the same bacterial species or one strain from different sources and is the most efficient variety of stock vaccine. Mixed vaccines are those which contain two or more strains from different species and are intended for mixed infections or those in which there is a variety of infecting bacteria. Consult Kolmer, J. A., 'A Practical Text-Book of Infection, Immunity, and Specific Therapy' (Philadelphia 1915).

ANDREW F. CURRIER, M.D.

VACCINE THERAPY. See VACCINE.

VACCINIACEÆ, a family of *Ericales,* comprising several genera of trees and shrubs, and including some epiphytes. This family is

widely distributed throughout the north temperate and frigid zones, and its fruits are generally edible. The leaves are alternate, and are either coriaceous and evergreen, or thin and deciduous. The various species have pretty flowers, the lobes occasionally being reflexed; in color they range from greenish-white to deep rose. The only members of the *Vacciniaceæ* extensively cultivated in America are the cranberries (*Oxycoccus*) which are evergreen, woody, vine-like shrubs, growing in sphagnum bogs. They are small and slender and are somewhat trailing in habit, but have ascending or erect branches bearing oblong leaves, and pink, star-shaped flowers in clusters. The cranberries are oval, pendulous on filiform stalks and have a shining red skin and firm, white flesh, of a very acid taste. Cranberries are cultivated in lands which can be submerged, are ripe in the fall and are sent to the markets in great quantities, to be served as sauce with poultry and game. The mountain-cranberry of the southern United States is a taller shrub with thin leaves (*Oxycoccus erythrocarpus*); that of Europe (*Vaccinium vitis-idæa*) is a low, evergreen shrub, with coriaceous, oval leaves crowded onto the creeping stems. Both grow on rocky hills and mountains, and the latter is found quite around the northern world. Its flowers are small and campanulate, nodding in terminal clusters, and the fruit is a dark red globe, very acid and called cowberry. It is used locally for preserves. The so-called whortleberries (of which name "huckleberry" seems to be a corruption) of Europe include not only this last species, but *Vaccinium myrtillus* and *V. uliginosum*. The former is the bilberry, or in Scotland the blueberry, and is of varying height, but rarely exceeding two feet, with deciduous ovate leaves. The berries, which are dark purple, with a mealy bloom, grow to the size of a black currant and are sweet-flavored. Their juice, combined with alder-bark and alum, is said to be used by northern Russian women to dye their hair bright-red. Nearly all the fruits of the genera *Vaccinium* and *Gaylussacia*, in America, are known either as blueberry or huckleberry, and are equally edible and good. There is a tendency, in the markets at least, to call those berries which are black and shining huckleberries, and the blue ones blueberries. They are a favorite midsummer fruit both among the Indians, who dried them, and sometimes included them in pemmican, and with white people. Thoreau exclaims, "Are they not the principal wild fruit?" thinking of the great tracts the bushes sometimes cover and the prolificness of their bearing. From June to August gathering huckleberries is one of the great industries of country districts, the fields being burnt over to promote the growth of the bushes and the produce sent either raw to the markets, or to canning factories. *Vaccinium canadense*, *V. pennsylvanicum* and *V. nigrum* are dwarf shrubs, the two latter often growing together on sandy hillsides, and furnishing the first blue and black berries of the season. Their flowers are creamy white or pinkish. In swampy, sandy thickets one finds the tall resinous blue-tangle, or dangleberry (*Gaylussacia frondosa*), with scanty campanulate blossoms, on filiform pedicels. The leaves are ovate and glaucous beneath, and the delicious berries are large, globose and blue with a bloom, and very juicy and sweet. Of all the American species of *Vaccinieæ*, the high-bush blueberry (*Vaccinium corymbosum*) is probably the most conspicuous. It is a tall, straggling shrub of damp woods, quite 10 feet high, at its best. With the leaves, in spring, it hangs out large white bell-like corollas, in racemose clusters. The berry is large and blue, and of a pleasant acidulous flavor; it is one of the last to appear in the markets. In fall, the oval leaves turn to vivid scarlet, and remain in a glow of color for a long time. *Batodendron arboreum*, the farkleberry, bears an inedible fruit, but attains to the dignity of a tree in the South. *Polycodium stamineum* is the squawberry (q.v.), or buckberry; *Chiogenes hispidula* is the snowberry (q.v.).

VACHELL, Horace Annesley, English author: b. 30 Oct. 1861. He was educated at Harrow and the Royal Military College, Sandhurst. He was a lieutenant of a rifle brigade in 1883 and subsequently lived some years in California, where he wrote several novels, among which are 'The Romance of Judge Ketchum' (1894); 'The Quicksands of Pactolus' (1896); 'The Procession of Life'; 'Brothers' (1905). An account of his California experience is given in his 'Life and Sport on the Pacific Slope' (1900). Since 1894 he has written one or more novels every year, the most successful being 'John Chouty,' 'The Other Side,' 'Spragge's Canyon' and 'Bunch Grass.' Latterly he has taken to playwriting, and his 'Lady Camber' was popular in 1915.

VACHEROT, Etienne, French author: b. Torcenay, near Langres, 29 July 1809; d. 28 July 1897. He was educated at the Ecole Normale, and returned there as director of studies in 1838, from which he was dismissed through the enmity of the Clerical party. In 1868 he was elected to the Academy. His principal works are 'Histoire Critique de l'Ecole Alexandrie' (1846–51); 'La Metaphysique et la Science' (1858); 'La Religion' (1869); 'La Democratie Liberale' (1892).

VACUOLE, in biology. See CELL.

VACUUM, in the strict sense, a portion of space entirely devoid of matter. The "absolute vacuum," as thus defined, is still a mere intellectual concept because no physical or chemical method has yet been devised for effecting the absolute removal of every last trace of matter from any portion of space having finite, measurable dimensions. If a vessel of glass or other material impervious to air is filled with air or any other gas, and the contents of the vessel are then removed as perfectly as possible by means of a good modern air-pump, a degree of exhaustion can be attained which is so perfect that no residual matter can be detected in the exhausted space, save by the most refined methods of testing. Spaces which have been partially exhausted, but which still contain a quantity of gas great enough to be easily detected, are called "partial vacuums," and those in which the process of exhaustion has been pushed to a very high degree are called, for the sake of distinction, "high vacuums." The first known method for producing a high vacuum was that of Torricelli, who filled a glass tube, closed at one end and more than 30 inches long, with mercury, and then inverted the tube

so that its open end dipped beneath the surface of a vessel also containing mercury. The atmospheric pressure is capable of sustaining a pressure only equal to that due to a mercury column some 30 inches high (see BAROMETER); so that when the experiment here indicated is performed, the mercury sinks in the tube until it stands above that in the lower vessel by only this amount. The space at the upper end of the tube, from which the mercury thus retires, was long considered to be the most perfect vacuum attainable. It is not absolutely perfect, however, because it contains a small amount of mercury vapor, as well as traces of air. The method of Torricelli is not a convenient one for the practical production of high vacuums, for it is often objectionable to introduce mercury directly into the space to be exhausted, and it is also difficult, in many cases, to fill such a space with mercury so completely as to exclude small bubbles of air. Hence, in the practical production of vacuums, it is usual to remove the air (or other gas) from the space to be exhausted, by means of some form of a pump. The earlier pumps that were employed for this purpose (and which are still employed when high vacuums are not essential) were similar in principle to the "suction pumps" that are used for drawing water. They consisted of one or more cylinders, provided with tightly-fitting pistons, and valves as nearly perfect as possible. Each stroke of a pump of this kind removes a certain fraction of the mass of gas remaining in the vessel to be exhausted; but it is theoretically impossible to produce an absolute vacuum in this manner, not only because an infinite number of strokes would be required, but also because it is impossible to prevent a certain amount of leakage around the pistons of such pumps. Other grave mechanical difficulties also obtrude themselves when the vacuum attains to a moderate degree of perfection. For the production of the high vacuums that are used in the manufacture of incandescent electric lamps, and for the far more perfect ones that are needed in modern scientific research, it is, therefore, necessary to employ some other means. Geissler, in 1855, invented a mercury pump, in which advantage is taken of Torricelli's principle for the production of a vacuum. The vessel to be exhausted is not filled with mercury, but it communicates with a large bulb which can be alternately filled with mercury and emptied, by merely raising and lowering a reservoir of mercury, with which it is connected by means of a flexible tube. When the mercury is caused to run out of the pump-bulb by lowering the reservoir, the air from the vessel to be exhausted expands into the bulb; and when the bulb is again filled by raising the reservoir, the air that the pump-bulb contains is caused to pass out through a special passage provided for that purpose, so that it does not return into the vessel that is being exhausted. By means of a mercury pump working on this principle, it is possible to reduce the pressure in the exhausted space to the 100,000th part of an atmosphere. About 1865, Sprengel invented an ingenious and still more perfect mercury pump, by means of which exceedingly high vacuums may be obtained. In Sprengel's apparatus a stream of mercury is caused to pass down a small tube called the "fall-tube," in the form of a rapid succession of separate drops; a small quantity of air from the vessel to be exhausted being entrapped between every two successive drops. The mercury sweeps this entrapped air down through the "fall-tube," which discharges, at the bottom, into a cistern. The Sprengel pump is slow in its action, but by its aid it is possible to produce vacuums so nearly perfect that the residual pressure probably does not exceed the 400,000,000th part of an atmosphere. In producing high vacuums, it is necessary to remember that glass and other solid bodies are usually covered by a thin coating of highly condensed air (or other gas), or of water vapor, which adheres to them like a thin film of varnish. This film is quite persistent under ordinary circumstances, and is not given off at once, even in a high vacuum. If the film were not removed during the exhaustion, however, it would gradually leave the glass afterward, becoming disseminated through the exhausted vessel, and so reducing the vacuum very seriously. To prevent the vacuum from being injured in this manner, the exhausted vessel is heated, by means of a Bunsen burner or otherwise, while the pump is in action. The rise in temperature accelerates the motions of the molecules of the air-film to such an extent that these molecules fly off into the interior of the vessel, from which they are then removed by the pump. High vacuums are sometimes obtained by combining the air-pump with other devices that are suggested by chemistry and physics. Thus Andrews produced high vacuums by filling the vessel to be exhausted with carbon dioxide gas, removing the greater part of this gas by means of an air-pump, and then absorbing as much as possible of the remaining quantity, by means of fragments of caustic potash that had been previously introduced. Advantage has also been taken, in a similar manner, of the absorptive power of freshly-prepared charcoal, for improving the air-pump vacuums. The charcoal is placed preferably in a side tube communicating with the exhausted vessel, and is kept heated during the exhaustion, in order to prevent it from absorbing the gas until after the pump has ceased working. The exhaustion having proceeded by means of the pump to as high a degree as is possible, or as is desired, the connection to the pump is sealed off, and the charcoal, upon being allowed to cool, then absorbs within its pores a considerable part of the gas still remaining in the vessel. The perfection of the vacuum in the finished tube can be regulated, within certain limits; for by heating the charcoal more or less a greater or lesser part of the gas that it contains can be temporarily expelled, so as to reduce the degree of the vacuum. Dewar successfully applied liquid hydrogen to the perfecting of vacuums; the vessel to be exhausted being provided with an auxiliary bulb which can be plunged into the liquid hydrogen after the exhaustion has proceeded as far as possible by the direct action of the pump. The intense cold of the liquid hydrogen causes a considerable part of the residual gas in the vessel to condense upon the walls of the auxiliary bulb, which is then sealed off from the main bulb by means of a blow-pipe.

For many reasons, the phenomena accompanying the discharge of electricity through vacuums have been greatly studied by physicists.

A perfect vacuum would (according to received theories) be a perfect non-conductor of electricity; and although such a vacuum is unattainable by experimental methods, vacuums have been prepared, through which the discharge of a powerful induction coil cannot be forced. At ordinary atmospheric pressure, the discharge from an electrical machine, or an induction coil, passes through a gas intermittently, and in the form of thread-like bunches of sparks resembling miniature flashes of lightning. Suppose, now, that electrodes are sealed into the two opposite ends of a vacuum tube, and that the tube is gradually exhausted by a good air-pump. The discharge, at first resembling loose threads gathered together at the ends, gradually loses this appearance as the exhaustion proceeds, and after a time the whole tube becomes filled with pale light; and when the pressure becomes reduced to about the 10,000th part of an atmosphere, the discharge assumes a stratified or striated appearance. In a vacuum tube of cylindrical form, with an internal electrode at each end in the form of a circular metal disc with its plane perpendicular to the length of the tube, we observe, as the pressure approaches the value here given, that there is a notable difference in the appearance of the tube at the two ends. The negative electrode is often covered with a soft, velvety glow, either wholly or in patches. Outside of this there is a dark space called "Crookes' dark space," or the "first dark space"; the width (or thickness) of this being roughly (but not accurately) proportional to the reciprocal of the density of the gas in the tube. According to Puluj, in a tube such as here described, the thickness of the Crookes' dark spaces, when the residual gas is air, and the pressure is reduced to the 13,000th of an atmosphere, is about one inch. Next beyond the Crookes' dark space comes a luminous space which is called the "negative glow"; and next after this there is usually (but not invariably) a second comparatively non-luminous region called the "second negative dark space," or, sometimes, the "Faraday dark space." Next after this comes a glow which is called the "positive column," and which reaches all the way to the positive electrode. It is in this part of the tube that the striations, referred to above, occur. They consist in a succession of disc-shaped luminosities, spaced at fairly uniform distances so long as the tube is of uniform diameter and separated by dark intervals; the discs being perpendicular to the axis of the tube. The stratifications are sometimes absent, and when they are present they often have an irregular motion of translation along the tube, this motion being sometimes in one direction and sometimes in the other; that is, sometimes toward the negative electrode and sometimes away from it. When the tube contains a mixture of gases there appears to be a separate series of stratifications for each constituent gas. The motion of the stratifications is best observed by noting the reflection of the tube in a rapidly-revolving mirror, and it is often of such a character as to make the stratifications appear confused to the unaided eye or to obliterate them completely. When the tube has movable electrodes it is found that a shift of the position of the negative electrode (that is, the cathode), causes a corresponding shift in the positions of the stratifications; these behaving, in this respect, as though they were rigidly connected with the cathode; but they are not at all affected by shifting the position of the positive electrode (or anode), except that since they do not extend beyond the anode, they are successively obliterated as the anode passes them. The phenomena of these vacuum discharges are very complicated, and special works dealing with these matters must be consulted for a really adequate description of them. The vacuum tubes produced at the factory of Heinrich Geissler, at Bonn, Germany, were of such excellence that the expressions "Geissler tubes" and "vacuum tubes" could at one time be regarded as almost synonymous.

The phenomena of electrical discharges in partial and high vacuums have been investigated by many distinguished physicists; but the name of Sir William Crookes is associated with some of the most remarkable of the discoveries that have been made, and many of the tubes that have been prepared for illustrating the properties of high vacuums were designed by him and are, therefore, known by his name. Crookes discovered, for example, that when the exhaustion of a tube is pushed considerably beyond the point at which the appearances described above are observed, the character of the electrical discharge is again changed, and mechanical, electrical and luminous effects are to be observed, which are not manifested in the lower vacuums. Exceedingly interesting mechanical effects were discovered in tubes which had been exhausted until the pressure of the residual gas was reduced to about the 250,000th of an atmosphere, and Crookes invented the radiometer for the purpose of demonstrating some of these. The radiometer consists of a glass sphere, two inches or so in diameter, and containing a light flier or wheel provided with four horizontal arms, each arm carrying at its extremity a light, vertical vane made of mica and blackened on one side. The wheel is poised delicately upon the point of a fine needle, so that the smallest force will cause it to rotate. When the glass bulb has been exhausted so that the residual pressure is only about the 250,000th of an atmosphere, and the instrument is placed in the sunlight or exposed to any source of radiant heat, the little flier or wheel at once begins to rotate in such a direction that the unblackened sides of the vanes move forward. Numerous explanations of the operation of this little instrument have been given, but that which is based upon the kinetic theory of gases appears to be the most satisfactory. (See GASES, KINETIC THEORY OF). According to this view a gas consists of an enormous number of little particles, or molecules, flying about in a space that is otherwise devoid of matter. In a gas of ordinary density these particles are so numerous that they do not travel on an average more than a few millionths of an inch without colliding with one another. But when, by removing nearly all of the gaseous molecules, we make it possible for the molecules that remain to travel on an average something like an inch or two between successive collisions with one another, these residual molecules act like tiny projectiles and are capable of producing mechanical effects that are not observable when the motions of the molecules are interfered with by the incessant collisions among the molecules themselves. The full theory of the radiometer

is not yet in an entirely satisfactory condition; but in a general way we may say that when the vanes of the little wheel are exposed to a source of radiant heat, the black sides absorb heat more readily than the light ones, and hence become warmer. This means that the molecules composing the vanes are vibrating more energetically on the black sides, so that on this side they strike more energetic blows against such gas molecules as chance to come in contact with them. From the equality of action and reaction it follows that the vanes of the little flier will experience a reactionary force tending to make them revolve with the light side foremost. In order that the radiometer may work satisfactorily it appears to be necessary to have the vacuum sufficiently high to ensure that, on an average, a gas molecule which has collided with one of the vanes will strike the glass wall of the enclosing bulb before encountering another gas molecule.

The behavior of a high vacuum under the influence of electrical discharges is especially interesting. When the perfection of the vacuum is such that the average distance that a molecule of the residual gas travels between successive collisions with its fellow molecules is comparable with the dimensions of the tube itself (that is, when the pressure in the tube is only about 1,000,000th of an atmosphere), the position and shape of the positive electrode, or anode, appear to have very little influence upon the character of the discharge. In such a case the nature of the visible discharge appears to be determined almost absolutely by the cathode, or negative electrode, and the discharge makes itself manifest in the form of a shaft of pale bluish or purplish light, extending outward into the tube in a direction approximately perpendicular to the surface of the negative electrode. If this electrode is made concave the streamer that proceeds from it (and which is known as the "cathode ray") may be made to converge to a focus, diverging again after passing the focus, so that the complete streamer has the general form of a double cone, one base of which rests upon the cathode, while the other rests upon the glass wall of the tube, opposite to the cathode. Where the cathode ray strikes the glass, the glass is excited to fluorescence, and it also becomes heated at this point. The whole phenomenon, in fact, is of such a nature as to strongly suggest that the cathode ray consists of a torrent of material particles; and it is natural to assume that the molecules of the residual gas within the vacuum tube receive electrical charges as they come in contact with the cathode, being then violently repelled from it in a direction normal to its surface. Crookes found, in fact, that this "projectile hypothesis" agrees well with practically all of the phenomena that he observed in these high vacuums. He observed, for example, that the cathode ray is apparently cut off by the interposition of any solid matter, even by a very thin film of mica, which would presumably be transparent to ether-waves; and he constructed many ingenious and beautiful forms of tube for showing that the cathode ray is capable of exerting precisely such mechanical effects as would be expected if the projectile hypothesis were correct. In one of the most interesting of these tubes the cathode ray is caused to strike against one side of a little paddle-wheel, the wheel being thereby caused to revolve just as a water-wheel revolves when its lower half is immersed in a running stream of water. The direction of rotation in this form of tube may be reversed readily by reversing the polarity of the two electrodes. Objections may be urged to this simple projectile explanation, however. For example, there are reasons for doubting if an isolated molecule of gas can receive an electrical charge in the way that the molecules of the residual gas have been assumed to be charged by the cathode. Despite this objection, it must still be regarded as probable that the projectile hypothesis of Crookes is true in some form or other. According to the electron theory the cathode ray consists, not of whole gas molecules but of tiny particles that are split off from the molecules. These ultimate particles, or electrons, certainly do carry electrical charges, and it is quite likely that the mechanical and other effects that are observed in vacuums where the pressure is not more than the millionth part of an atmosphere are due to the projectile-like motions of the free electrons. Crookes' experiments were carried out before the idea of electrons was developed; but it should be said, in justice to him, that in describing his work he frequently emphasized his belief that the matter in his tubes is in a state quite different, in some respects, from any state with which we had previously been familiar; and he called this, provisionally, the "fourth state" of matter, since he considered it to be as different from a gas as a gas is from a liquid or a solid. A vast amount of research has been carried out, in recent years, in connection with the phenomena observed in high vacuums, and the subject must now be considered in its relation to the electron theory, radioactivity, and X-rays, if it is to be properly understood. See ELECTRON THEORY; MOLECULAR THEORY; RADIOACTIVITY; X-RAY; and consult bibliographies given.

ALLAN D. RISTEEN.

VACUUM PUMPS. So long as the vacuum was of interest mainly to the physical laboratories the forms of pumps for producing vacua were delicate contrivances, largely of glass, and of very limited performance, suitable only for experimental purposes. When the vacuum became a manufacturers' necessity, the machinery for its production took on a different phase. The limit of exhaustion possible to the laboratory air-pump (q.v.) is reached when there is no longer in the system air enough to lift the valves (by its expansion). As even the lightest valve which could be constructed ceased to work while a considerable amount of air remained, the results were inadequate to the demands of such industries as, for example, making of electric lamps.

For economic purposes the vacuum pump most in use is the oil-valve pump, in which the piston is of the "bucket" form and is continually filled with oil, the piston valves being practically floated in the oil when the vacuum becomes of high degree. The piston works on the gaseous material between two basins of oil. With a double cylinder pump working in tandem the results are excellent, the vacuum reaching $\frac{1}{1000}$ of an atmosphere (14.7 pounds per square inch) in pressure. Another pump used in commercial work is a modification of

the Sprengal mercury pump, the action of which is the reverse of the air-lift. (See PUMPS AND PUMPING MACHINERY). A constantly falling column of mercury is made to float downward past a Y-branch into the mercury tube, the Y being connected with the gas reservoir to be exhausted. The falling mercury traps and drags the gas down with it in bubbles, discharging it into the basin below, where the gas escapes. The mercury is pumped up again to the feeding basin at the head of the column. The vacuum obtainable with this pump is $\frac{1}{1000000}$ of an atmosphere, but the action must be prolonged to achieve such rarefication.

For high vacuum work Gaede's molecular pump is in considerable use. It depends for its action upon the friction of gas upon the surface of a solid. Fig. 1 shows a diagrammatic

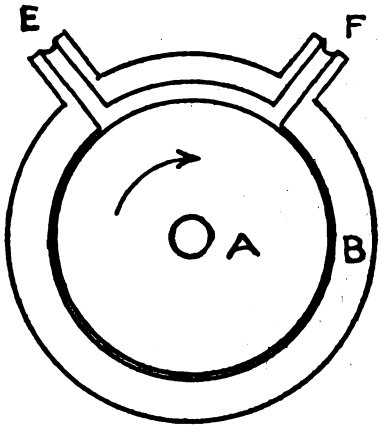


FIG. 1.—Sectional Diagram of the Gaede Molecular Vacuum Pump.

section of this pump. A cylinder (A) is made to rotate clockwise in a casing (B) in which are two openings (E and F) connected by a slot. The opening E connects with the gaseous material to be exhausted, and the opening F is the outlet of discharge. In operation the gas is dragged from E toward F by its friction with the revolving cylinder A, and a difference of pressure at those two points is established proportional to the speed of rotation and the internal friction of the particular gas. At speeds of 8,000 to 12,000 revolutions per minute a vacuum equivalent to $\frac{1}{1000000}$ of an atmosphere has been obtained. The action of this pump is very rapid.

In Fig. 2 is shown a sectional diagram of the Langmuir Condensation pump, the most rapid of all vacuum pumps. In construction it is a cylinder of metal (E, E) having within it a smaller cylinder (F), above which is placed a shield of an inverted cup-like shape. The cylinder E is surrounded by a water jacket (W). At G is an inlet for the gaseous material to be exhausted, and at O the outlet for the gas. In operation a quantity of mercury is placed in the bottom of the cylinder, small openings being provided into the inner cylinder F so that the mercury circulates in both. Heat is supplied below F, and the mercury is vaporized, the vapor passing up to the top of F and over the edge, being deflected downward by the shield S and rushing out by the annular opening A, A. The gas is dragged downward by the swiftly moving vapor which is condensed into metallic mercury when it strikes the cool walls next the water jacket, thus forming a vacuum into which the gas flows, being urged onward by the constant stream of mercury vapor from A, A. Being

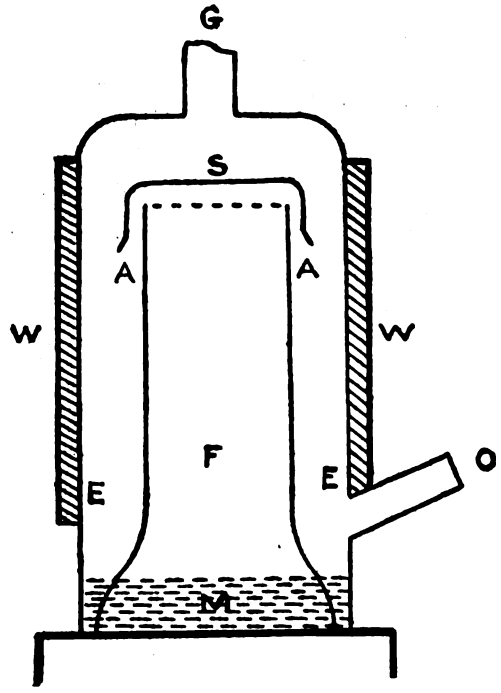


FIG. 2.—Sectional Diagram of the Langmuir Condensation Vacuum Pump.

crowded down to the level of O it flows out of the pump. The continually condensing mercury drops to the bottom of the cylinder and passes into the central cylinder, to be used over and over again. With a Langmuir pump of three inches outside diameter, the performance amounts to from 180 to 240 cubic inches of gas exhausted per second, the vacuum obtained being equivalent to $\frac{1}{1000000}$ of an atmosphere.

VADOSE WATER. See GROUND WATER.

VAGA, vä'gä, **Perino Del**, or more properly **PIETRO BUONACCORSI**, Italian painter: b. Florence, 1500; d. Rome, 1547. He was taught painting by a Florentine named Vaga (whence the name generally applied to him), by whom he was brought to the notice of Giulo Romano and other pupils of Raphael. The latter, then engaged upon his designs for the loggia of the Vatican, employed him to assist Giovanni da Udine in the arabesque work, and subsequently entrusted him with the execution of some of the principal frescoes. He thenceforth was a favorite pupil of Raphael, after whose death he rose into great reputation. Compelled to leave Rome in 1527, on the sack of the city, he went to Genoa, where he entered the service of the Prince Doria and founded a school of painting. He returned to Rome during the pontificate of Paul III, by whom he was entrusted with many valuable commissions; and at the time of his

death probably stood at the head of the Roman school. He designed after the style of Michelangelo, and by Vasari is placed in that respect next to the great Florentine master. His works are widely distributed over Italy, the best being the 'Creation of Eve' in the church of Saint Marcello in Rome. He also frescoed the ceiling of the Sala Regia in the Vatican. His artistic activity extended to the designing of tapestry, baldacchini and the execution of stucco work.

VAGANTES, vā-găn'tēz (wanderers, vagabonds), a term applied in the Middle Ages to the wandering bands of scholars (*vagi scholares*), who, during the intellectual movement which pervaded Europe during the 12th and 13th centuries, formed a distinct and characteristic class in the population, and played an important part in the social life of the time. They were sometimes called *Bacchantes* — Brethren of Bacchus — from their drunken roystering habits. They were renowned for their songs, full of life and movement, and often keenly satirizing the clergy and religious orders. These 'Carmina Burana' form a collection, a manuscript copy of which is still to be found in the Benedictine abbey at Munich. The verses are in rhymed Latin, or written in macaronic style of German or French and Latin; some are German or French pure and simple. They deal with religious controversy, love, wine and sport; some are absolutely frivolous; others pious in tone. In France the *vagantes* were known as "Goliardæ," probably because they generally pursued their peregrinations under the leadership of a man of gigantic stature (Goliath). Consult Hubatsch, 'Die lateinischen Vagaten des Mittelalters' (1870); Von Barnstein, 'Carmina Burana Selecta' (1879).

VAGRANCY, the life or habits of an individual without fixed habitation, or vagrant, who is classed in law as (1) an idle and disorderly person, able, in whole or in part, to maintain himself and his family, but who neglects to do so; (2) rogues and vagabonds, persons suspected of living by crime; (3) incorrigible rogues. A vagrant is consequently an able-bodied man without any visible means of support and without fixed abode. His essential characteristic is "work-shyness," or idleness self-imposed and voluntary. In most of the United States various enactments and ordinances of more or less severity have been made for the suppression and punishment of vagrants and tramps; but such characters are still numerous, their number being estimated at 600,000, and their cost to the nation over $200,000,000 yearly, to the railroads, $25,000,000 and according to a recent conservative estimate $2,000,000 to the State of New York alone. A charge of vagrancy is frequently made by the police simply to justify an arrest made for other purposes for which, however, an arrest cannot legally be made in order to prevent an offense which is imminent or in course of being committed, or to detain a person against whom a more serious charge or indictment is pending. Vagrancy laws and statutes are designed to protect the public from the depredations of the vagrant and to relieve it of his support. Legislation, however, has not checked vagrancy due to the fact that vagrancy is a national problem, which the unit legislating against it is the State. Uniform repressive legislation in all States is necessary to the solution of the problem.

Difficulties arise in administering such laws as we have for the control of vagrancy, owing to the fact that popular sympathy is easily aroused by the man out of work and seeking employment and many of the vagrant pretend to be going about in search of work; but though there are doubtless some unfortunate honest workmen among them (who, if they could be selected from the mass, should receive all possible consideration and aid in securing work), the great majority of tramps form a class, who, from mental constitution, choose any course rather than work. It is hard to understand what inducements can lead them to prefer their wandering and shifty life. Apparently the freedom of it and the immunity from work are its chief attractions. They have been well described as wandering about "ready for any crime, but not planning crimes; quite ready to rob, but very much afraid of large dogs; very courageous against unprotected women, but skulkers when a broad-shouldered laborer turns his eyes their way; with no purpose except wandering, no restraint except hunger, no hope except of getting drunk upon some lucky haul, nomads in the midst of civilization, simple savages without savage resources."

An expert on sociology has stated that "the most effective check on vagrancy is the proper kind of education of the young during the years from 10 to 20. The schools, the home and the church must all do their part in preparing youth for a reasonable, honest and efficient life. Child labor, illness, mental defectiveness, congestion of population, truancy, orphanage, inefficiency, low wages, overwork, industrial accidents, diseases of occupation, the temptations of crime, seasonal and irregular trades, all these causes and many more operate to produce the youthful tramp." Consult Dawson, W. H., 'Vagrancy Problem' (1910); Kelly, E., 'Elimination of the Tramp' (1908); Massachusetts Board to Investigate the Subject of the Unemployed, 'Wayfarers and Tramps' (in Massachusetts House Document No. 50, 1895); Michigan State Library, 'Laws of the Various States Relating to Vagrancy' (1910).

VAGRANTS. See MENDICANCY.

VAIGACH, vī-gäch', Russia, an island in the Arctic Ocean, belonging to the government of Archangel, separated from the mainland by the Yugor Strait and from Nova Zembla by Kara Strait, and forming with Nova Zembla the western boundary of the Kara Sea. The mountain chain of the adjacent mainland peninsula is continued in the island by a low chain near the east coast. Vegetation is scant, but the island is visited by Russians and Samoyedes in search of fur-bearing animals and fish. The area is about 1,410 square miles.

VAIKUNTHA, the paradise of Vishnu (q.v.), according to the Vaishnava sect of the Hindu religion, the supreme deity.

VAIL, Alfred, American inventor: b. Morristown, N. J., 25 Sept. 1807; d. there, 18 Jan. 1859. He was graduated at the University of

the City of New York in 1836 and in 1837 became associated with S. F. B. Morse (q.v.) in his telegraphic experiments. His mechanical knowledge applied to the experimental apparatus resulted in the first practicable Morse machine. He invented the combination of the horizontal-lever motion to actuate the style; devised the alphabet of dots, spaces and dashes which it necessitated; and in 1844 constructed the automatic lever and grooved roller which embossed on paper the characters he originated. He was appointed assistant superintendent of the telegraph line constructed between Baltimore and Washington in 1843 and on the completion of the system, in 1844, was stationed at Baltimore, where he invented the finger-key, and received the first message from Washington. Consult Pope, 'The American Inventors of the Telegraph,' in *The Century*, Vol. XXXV (1888). See HENRY, JOSEPH.

VAIL, Charles Henry, American Universalist clergyman: b. Tully, N. Y., 28 April 1866. He studied music in New York and for a while engaged in teaching it. He was graduated at Saint Lawrence University, Canton, N. Y., in 1892, and during the following year pursued his theological studies. In 1893–94 he was minister of All Souls' Church, Albany, N. Y., and from 1894 to 1901 of the First Universalist Church in Jersey City, N. J. In 1901 he was nominated governor of New Jersey by the Socialist party, of which in 1901–02 he was national organizer. He has lectured in many parts of the country and has published 'Modern Socialism' (1897); 'National Ownership of Railways' (1897); 'Scientific Socialism' (1899); 'The Industrial Evolution' (1899); 'Mission of the Working Class' (1900); 'Socialism: What It Is and What It Is Not' (1900); 'The Socialist Movement' (1901); 'The Trust Question' (1901); 'Socialism and the Negro Problem' (1903); 'Ancient Mysteries and Modern Masonry' (1909); 'Militant and Triumphant Socialism' (1914).

VAIL, Stephen Montford, American clergyman and educator: b. Union Vale, Dutchess County, N. Y., 15 Jan. 1816; d. Jersey City, N. J., 26 Nov. 1888. He was graduated at Bowdoin College, Maine, in 1838 and Union Theological Seminary in 1842. He joined the New York Conference of the Methodist Episcopal Church in 1842 and served Fishkill, N. Y., Sharon, Conn., and Pine Plains, N. Y. For two years he was principal of Pennington Seminary (1847–49). From 1849 to 1868 he was professor of Hebrew at Concord Biblical Institute. He resigned because of ill health and lived on Staten Island. He was appointed United States consul to Bavaria where he served five years (1869–1874). He then retired from active service. He did much to destroy the prejudice against a theological seminary-trained ministry on the part of the Methodists. He was a strong abolitionist and several of his sermons and addresses on slavery were published. He also published 'Ministerial Education in the Methodist Episcopal Church' (1853); 'Life in Earnest: or Memoirs and Remains of Rev. Zenas Caldwell' (1855); 'Outline Lessons in Hebrew.' Consult 'Funeral and Memorial Services of Stephen M. Vail' (Jersey City 1881); also Minutes of the Conferences of the Methodist Episcopal Church, 1881, p. 85.

VAIL, Theodore Newton, American capitalist: b. Carroll County, Ohio, 16 July 1845. He was educated at Morristown Academy in New Jersey, studied medicine with his uncle for two years and then became assistant superintendent in 1873 and general superintendent (1875–78) of the railway mail service, Washington, D. C. He went into the telephone business (1878–87) and installed many systems in the principal South American cities. Since 1897 he has been president of the American Telegraph and Telephone Company and an officer of many corporations at home and abroad. He is a member of numerous societies, clubs, etc.

VAIL, Thomas Hubbard, American Protestant Episcopal bishop: b. Richmond, Va., 21 Oct. 1812; d. Bryn Mawr, Pa., 6 Oct. 1889. He was graduated from Washington (now Trinity) College, Hartford, Conn., in 1831, and from the General Theological Seminary in 1835. He took orders in the year last named, and in 1837 organized Grace Church, Worcester, Mass. He became rector of Christ Church, Cambridge, Mass., in 1837, in 1839 of Saint John's, Essex, Conn., and was rector of Christ Church, Westerly, R. I., 1844–56. He was subsequently rector of Saint Thomas' Church, Taunton, Mass., 1857–63, and of Trinity Church, Muscatine, Iowa, 1863–64. In the last-named year he was consecrated first bishop of Kansas. He founded Bethany College at Topeka, Kan., and served as its president, and was author of 'The Comprehensive Church' (1841; 3d ed., 1883), etc.

VAILIMA LETTERS, the correspondence of Robert Louis Stevenson (1890–94) called after his home at Samoa and descriptive of his life there. They were written to Sidney Colvin.

VAISESHIKA, vī-shā'shē-kā, a system of Hindu philosophy of ancient origin and closely resembling in its principles some of the conclusions of modern science. It teaches that all material substances are composed of atoms mechanically united and indestructible; that the combination of these atoms in the existing world will pass away, and the existing order of things will also pass away. The founder of the system was Kanada, supposed to have lived about 500 B.C., and the system itself was long regarded as heretical, from the Brahmanic viewpoint. It is now, however, fully recognized as of equal standing with the five other leading systems of Brahmanic philosophy, the two Mimansas, and the Nyaya, which were the three originally orthodox systems, and the Sankhya and the Yoga, which also bore for some time the stamp of heresy.

VAISHNAVAISM. See VAISHNAVAS.

VAISHNAVAS, vīsh'nạ-vạs, one of the three great divisions of Hindu religion, distinguished from the others by the special worship of Vishnu, but itself divided into many sects, based on the differences attending that worship. Horace Hayman Wilson has divided the Vaishnavas into the following sections: (1) Rámánujas, Sri Sampradáyis, or Sri Vaishnavas; (2) Rámánandis, or Rámávats; (3) Kabír Panthis; (4) Khákis; (5) Malúk Dásis; (6) Dádú Panthis; (7) Ráya Dásis; (8) Senáis; (9) Vallabhácháris, or Rudra Sampradáyis; (10) Mírá Báis; (11) Madhwácháris or Brahma Sampradáyis; (12) Nimávats, or Sanakádi Samprayadáyis; (13) the Vaishnavas of Bengal; (14)

Radhá Vallabhís; (15) the Sakhí Bhávas; (16) Charan Dásis; (17) Harischandís; (18) Sadhná Panthís; (19) Mádhavis; and (20) Sannyásis, Vairágís and Nágas. All these sects have their common ground in the belief in the supremacy of Vishnu over the other gods of the Trimurti. They differ, however, in the character and degree which they assign to this supremacy, and consequently in their religious devotions and practices. Their more modern teachings are outlined in the "Ramcaritmonas" of Tulasidasa. Their chief festival, celebrated annually in Bengal and other Hindu cities, is the "Rath Yaga." Many of the devotees paint upright lines on their foreheads. The Vaishnavas include many monastic bodies, composed of members of various Hindu castes, all united in doing honor to Vishnu as chief of the Hindu triad. Consult Muller, 'Six Systems of Indian Philosophy' (1899); and Macdonell, 'History of Sanscrit Literature' (1914). See BRAHMA; BRAHMANAS; VISHNU.

VAISRAVANA, vīs-rạ-vä'nạ, in the pantheon of the Hindu Sivaites, the god of wealth.

VALAIS, vä-lā (German, WALLIS, väl lis), Switzerland, a southern canton, abutting on France and Italy, and having an area of 2,027 square miles. The capital is Sion. The mountains and its southern border are known as the Valais Alps. The canton is surrounded by the loftiest and most magnificent mountain chains in Europe, the Bernese, Pennine and Helvetian or Lepontine Alps, all containing ridges 13,000 to 15,000 feet high, with magnificent glaciers. The Rhone flows through the whole length of the canton, forming the largest valley in Switzerland and discharges into the Lake of Geneva. Where the elevation is not too great the mountain-slopes are covered with large and valuable forests of pines, and lower down of hardwood trees, succeeded by productive orchards; rich pastures abound and support numerous cattle, the principal source of subsistence of the inhabitants. In the lower valley of the Rhone there is much arable land, the finer fruits are grown, and silkworms reared. The canton produces a good deal of wine. In the Upper Valais, German is spoken, in the Lower, which has the larger population, French is more commonly spoken. The canton was admitted into the confederation in 1553. Pop. about 130,000.

VALDAI (väl'dī) **HILLS,** Western Russia, a range of hills in the provinces of Novgorod and Tver, averaging about 300 feet in height, but rising in Mount Popovagora to 1,080 feet. They are well wooded, and contain the sources of the Volga, Dnieper and Düna.

VALDÉS, väl-dās', **Armando Palacio,** Spanish novelist: b. 1853. See JOSÉ.

VALDÉS, Gabriel de la Concepción (Placido), Cuban poet: b. Matanzas, Cuba, 18 March 1809; d. Havana, Cuba, 28 June 1844. He was a mulatto and his early life was spent in poverty. His poetry was popular and was published in different newspapers and reviews, but the sentiments expressed seem to have involved him in trouble with the authorities, as he was at one time imprisoned for several months. In 1844 he was accused of complicity in a conspiracy of the blacks against the whites, and though innocent was shot as a traitor. He was author of various romances and novels, and his poems have been published in several editions. Perhaps the best of his verse is his prayer, composed just prior to his death and which was translated into English by Mary Webster Chapman. Editions of his works include 'Poesías de Placido' (1838); 'Poesías de Gabriel de la Concepción Valdés, Placido' (1847).

VALDES (VALDESSO VALDEZ), Juan de, Spanish-Italian reformer: b. Cuenca, Castile, 1500; d. Naples, 1544. He was brother to Alphonse de Valdes, the imperial secretary of state, and was himself secretary to Charles V in Germany. After a sojourn of 10 years he left Germany and went to Naples to occupy the post of secretary to the viceroy. There he devoted himself to literature and gathered around him a band of choice spirits, including Vermigli (see PETER MARTYR), Ochino and the high-born ladies Vittoria Colonna, Julia Gonzaga, and Isabella Manriquez. Valdes and his company were enthusiastically set upon effecting the regeneration of the church of their day, but although they had no desire to leave the Roman obedience, they were regarded as heretics. Valdes wrote 'Spiritual Milk'; 'The Christian Alphabet,' and some commentaries on the New Testament. He wrote in the Spanish language, but the works above mentioned are only extant in their Italian translations. Consult Stern, 'Alfonse et Juan Valdez' (1869); Carasco, 'Alfonse et Juan Valdez' (1880); McCrie, 'Reformation in Italy.'

VALDEZ, Melendez. See MELENDEZ VALDES JUAN DE.

VALDEZ, Alaska, city on Prince William Sound. It is the most northerly port open during the winter and is on the great interior Alaskan mail route. The junction of the cable and land lines is made here. The city has churches and schools and a telephone system. Pop. about 1,000.

VALDIVIA, väl-dē'vē-ä, **Pedro de,** Spanish soldier, conqueror of Chile: b. Serena, Estremadura, about 1498; d. near Tucapel, Chile, 1554. He served in the Italian wars; went to Venezuela about 1534; and soon after joined Pizarro in Peru. He aided in the defeat of Diego Almagro (q.v.) at Las Salinas. Later he led 150 Spaniards and several thousand Indians in an expedition against Chile, which had been ceded by Charles V to Pedro Sanchez de Hoz. After defeating a large force of Indians he established Santiago, 12 Feb. 1541. Subsequently the Spaniards were many times attacked by the Indians and were cut off from Peru. In December 1543 reinforcements arrived, and the colony thereafter prospered. In September 1544 Valparaiso was founded, and in 1546 Valdivia marched into the Araucanian district, and in a great battle conquered the Indians. In 1547–49 he joined Gasea, the royalist, against Pizzaro, whom they defeated. In 1550–52 he established Concepción, Valdivia, and other places. A wide uprising of the Indians occurred in December 1553 and while Valdivia was endeavoring to suppress this revolt he was captured and put to death.

VALDIVIA, Chile, (1) capital of a southern province of the same name; on the Valdivia River, nine miles from its mouth, with a safe and roomy harbor, and railway connections

with the rest of Chile. The entrance to the river is fortified. The town is built on level ground, and is surrounded by apple orchards and native forest. It has an active coasting trade, chiefly with Valparaiso. Valdivia was founded in 1551 by Pedro de Valdivia, one of Pizarro's lieutenants, and it was at one time a place of great wealth. A wireless station is located here. Pop. about 10,000. (2) The province of Valdivia has an area of 8,991 square miles. It is watered by the Tolten, Valdivia and Bueno rivers. There is a chain of small lakes along the foot of the Andes. The chief port is Corral, at the mouth of the Valdivia. Besides splendid forests it has large upland pastures, and deposits of coal. Pop. about 153,000.

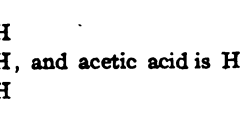
VALDOSTA, văl-dŏs'tą, Ga., city, county-seat of Lowndes County, on the Georgia Southern and Florida, the Plant System and the Atlantic, Valdosta and Western railroads, about 150 miles southwest of Savannah. It was settled in 1859 and in 1860 was incorporated. It is in a fertile agricultural region, the principal products of which are cotton, fruit, corn, wheat and vegetables. The chief manufactures are cotton products, including cotton cloth and lumber products. The city owns and operates the waterworks. There are three banks and several newspapers. The government is administered under a revised charter of 1900, which provides for a mayor, who holds office two years, and a city council. Pop. (1910) 7,656.

VALENCIA, vă-lĕn'shĭ-ą (Sp. vä-lĕn'thē-ä), Spain, capital of a province of the same name, on the south bank of the Turia or Guadalaviar, on the eastern coast, 185 miles east by south of Madrid. The city walls were removed in 1871, and their site transformed into broad boulevards, but two old gates have been left in position. Several bridges across the river lead to northern suburbs. The chief square is the Plaza del Mercado, or market-place, on the north side of which is the Lonja de la Seda, or silk exchange, a beautiful Gothic building of the 15th century, restored in 1892–95. The other noteworthy buildings and institutions of the city are: The cathedral (La Seo), completed in 1482, with an octagonal Gothic bell-tower called El Miguelete; the Colegio del Patriarca, an ecclesiastical building in Renaissance style (1586–1605), containing a church of Corpus Christi, pictures, frescoes, tapestry, etc.; the church of San Nicolas, with fine paintings by Juanes; the university, founded in 1441, with a valuable library; the Audiencia, formerly the chamber of deputies of the kingdom of Valencia, a 16th-century Renaissance edifice; the provincial picture gallery, strong in the Valencian school; the citadel, built by Charles V, now in ruins; the provincial and the military hospital; the penitentiary; the archiepiscopal palace, etc. The fine botanical garden, the bull-ring seating about 17,000, a theatre, and some other buildings are situated outside of the boulevard line; and on the north side of the river is the charming Alameda, lined with plane-trees. El Grao, the harbor, is at the mouth of the Turia, on the north side, and beside it are sea-bathing resorts. Valencia has manufactures of silk, cigars, paper, oil, chocolate, soap, hemp and linen weaving, velvet, hat, felt, plush, fans, gloves, hardware, leather goods, pottery, glazed brick works, etc., and a considerable and increasing trade in wine, oranges, rice, oil, silks, etc. Valencia figured in Roman history and was destroyed by Pompey in 75 B.C. It was long the capital of a kingdom of Valencia, which came to an end in 1319. In 1812–13 it was occupied by the French under Suchet. Pop. 233,348; of province, 911,429. The area of the province is 4,150 square miles.

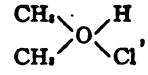
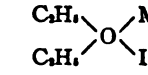
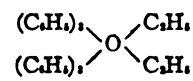
VALENCIENNES, France, town in the department of Nord, at the junction of the Rhondelle with the Scheldt (Escaut) 30 miles southeast of Lille. Its chief buildings and institutions are (or rather were, since the late war almost obliterated the town) the church of Notre Dame du Saint Cordon, a modern edifice in 13th century style, with fine stained-glass windows; an old Gothic church, with a modern tower; the town-hall, a 17th century building, with a façade of more recent date; a lyceum; a museum of painting and sculpture, rich in works of the Flemish school; a natural history museum; a municipal library; a civil and military hospital; an arsenal and barracks. The town suffered three severe sieges in 1793, 1815 and 1914. The district yields much coal, and among the manufactures of the town are chicory, beet-sugar, salt, potash, soap, glass, iron, woolen yarn and goods, linen, etc. The once flourishing lace industry is now extinct. Pop. of commune about 35,000. See WAR, EUROPEAN — WESTERN FRONT.

VALENCIENNES-LAÇE. See LACE.

VALENCY is that property of elements by virtue of which they unite to form compounds. The atom of hydrogen has never been known to combine with more than one atom of another element. In terms of this property hydrogen always shows the valency of one. Its valency is therefore taken as the unit of comparison. A number of elements form compounds with hydrogen. Chlorine forms HCl, oxygen forms H_2O, nitrogen forms NH_3, and carbon forms CH_4. Therefore, with hydrogen as the unit, the valency of these elements is one, two, three and four respectively. Or, as A. W. Hofmann expressed it in 1865: "It takes the whole atom-power of chlorine, 35.5, to engage one atom of hydrogen; whereas the atom-power of oxygen, 16, suffices to engage two hydrogen atoms; and the atom-powers of nitrogen and carbon suffice, respectively, to engage three and four hydrogen atoms." There are a number of elements with which hydrogen does not combine. The valencies of these elements can only be ascertained by indirect methods. In such instances information is gained by a study of the compounds of elements which can combine with hydrogen. For example, one atom of chlorine forms a stable compound with an atom of hydrogen. The same element will also form the following compounds: KCl, $ZnCl_2$, $AlCl_3$, $SnCl_4$, $MoCl_5$, WCl_6. Therefore, the valencies of potassium, zinc, aluminium, tin, molybdenum and tungsten are one, two, three, four, five and six respectively. The highest valency that an element has been known to exhibit is eight. The elements of the argon series (helium, neon, argon, krypton, xenon, niton) are remarkable in that they form no well-defined compounds with other elements. They are described as elements with no chemical affinity. In other

words, their valency is zero. With this property as a basis, elements may be classified as monads, diads, triads, tetrads, pentads, hexads, heptads and octads, the terms having reference to the valencies that are displayed in the formation of compounds. Elements are also designated as univalent, bivalent, tervalent, quadrivalent, etc. The theory of valency has also been extended to include radicles which remain unchanged during chemical transformations. The radicles CH_3, CN, CH_3CO, are univalent, SO_4 is bivalent, PO_4 is tervalent, P_2O_7 is quadrivalent, etc. As early as 1861 Crum Brown had suggested that the molecule of hydrogen is a complex of two atoms held together by a common bond, H—H. According to this system carbon dioxide is , ammonia is , and acetic acid is  . The bonds in each case represent the valencies of the elements forming the compounds. This system has also been employed by Kekulé, Frankland and others, and is sometimes used at the present day to emphasize the valency of each element in a given product. The system has been found especially fruitful in the domain of organic chemistry. An element does not always exhibit the same valency. It may possess a characteristic active valency which remains constant through a large series of chemical changes, but this valency is often a dependent variable, being influenced by physical as well as chemical conditions. The tervalent nitrogen in NH_3 assumes other valencies toward oxygen; sulphur may act as a diad, a tetrad, and a hexad; tin is a diad and a tetrad. In the compounds VCl_2, VCl_3, VCl_4, and $VOCl_3$ vanadium functions with the valencies of two, three, four and five. The variable property of valency was recognized by some of the founders of the theory. In 1852 Frankland published a memoir setting forth his views on valency in these words: "The compounds of nitrogen, phosphorus, antimony and arsenic especially, exhibit the tendency of these elements to form compounds containing three or five atoms of other elements; and it is in these proportions that their affinities are best satisfied: thus in the ternal group we have NO_3, NH_3, NI_3, NS_3, PO_3, PH_3, PCl_3, SbO_3, $SbCl_3$, AsO_3, AsH_3, $AsCl_3$, etc.; and in the five-atom group NO_5 NH_4O, NH_4I, PO_5, PH_4I, etc. Without offering any hypothesis regarding the cause of this systematic grouping of atoms, it is sufficiently evident from the examples just given, that such a tendency or law prevails, and that, no matter what the character of the uniting atoms may be, the combining power of the attracting element is always satisfied by the same number of these atoms." It is to be noted that Frankland employed the unit 8 for the atomic weight of oxygen, and the unit 16 for the atomic weight of sulphur.

Kekulé (1851), on the other hand, regarded valency as a fixed invariable property, asserting that this property must be considered as invariable as the atom itself. He argued that variations in valency are more apparent than real. To him phosphorus trichloride was a true molecule formed by "atomic combination," while the pentachloride was a complex of the molecules PCl_3 and Cl_2 formed by the saturation of the one with the other, there being no redistribution of atoms in this saturation. The formula of phosphorus pentachloride was therefore written as $PCl_3.Cl_2$. Cl_2, and its dissociation into PCl_3 and Cl_2 at elevated temperatures was taken as an evidence of a peculiar type of loose combination.

The views of Kekulé could not be harmonized with certain known facts even at that early period. Our present-day knowledge shows beyond dispute that even elements of apparently invariable valencies may exhibit variation in this property under certain conditions. For instance, although the science of organic chemistry has for its foundation the quadrivalency of carbon, the element may in a few isolated instances show the valency of two. Nef and others have advanced convincing arguments in favor of the bivalency of carbon in hydrocyanic acid (structurally represented as C≡N—H), in isonitriles R—N=C, and in fulminic acid C=N—O—H. The case of oxygen, the prevailing valency of which is two, is equally interesting. Thus oxygen compounds have been described in which the doctrine of invariable valency breaks down. There is no doubt that in the oxonium derivatives  ,  , and  , oxygen could function as a quadrivalent atom. According to Gomberg triphenyl methyl $(C_6H_5)_3C$, contains a trivalent carbon atom, although this has been questioned, and reasons have been advanced in favor of the adoption of $(C_6H_5)_3C—C(C_6H_5)_3$ as the more rational formula of triphenyl methyl. In view of these observations it is safe to assume that there are very few elements possessing constant valencies. As far as we know, hydrogen, sodium and potassium always show the valency of one. Calcium and barium appear to be always bivalent. Other isolated examples of invariable valency might be mentioned; but as a rule valency is a variable property. Although the theory of valency was first formulated by Frankland, Kekulé and others in the early 50's of the 19th century, its germ is to be found in the systems, theories and laws propounded by earlier investigators. Our present-day conception of valency is therefore intimately related to Lavoisier's analytical methods, Dallon's atomic theory, Gay-Lassac's volume relations, Avogadro's hypothesis, and to other theories and laws that have contributed to our better understanding of the science of chemistry during the past century. A number of theories have been proposed to explain the variable property of valency. Abegg states that each element possesses two kinds of valency, namely, normal and contra-valency. In metals the normal valency is electropositive, in non-metals electronegative. When one valency in an atom becomes saturated the remaining valencies will be strongly influenced. Neff claims that the unused valencies in a compound

saturate one another, and J. van't Hoff seeks an explanation of variability in the shape and form of the atoms. According to Friend there are three kinds of valencies: 1. Free negative valency inherent in elements which can combine with hydrogen. 2. Free positive valency, the numerical value of which is not so easily determined. 3. Residual or latent valency. These differ from the free valencies in that they can only be called out in pairs of equal and opposite sign. Werner distinguishes two kinds of valency, principal or primary, and auxiliary or secondary. According to his theory nitrogen, sulphur, chlorine, oxygen, platinum, gold and other elements may in some of their compounds bring into action their secondary valencies, forming complex derivatives. With this theory Werner endeavors to explain the constitution of double salts, crystalline hydrates and complex molecules.

It is generally admitted that none of these theories can account for all known facts. Each one, however, has made its contribution to the proper appreciation of observed phenomena. We are equally uncertain as to the true nature of valency itself. Of the theories that have been put forward to clear the situation the electrochemical theory and the corpuscular or electronic theory have been most favorably received. As early as 1806 attention had been directed by Sir Humphry Davy to the relation of chemical affinity and electrical force, and attempts had been made to employ this as a basis for a theory of chemical combination. Later in the century Faraday summed up his studies on electrolysis in a general law which states that the electrical charge which is conveyed by an ion of a metal in the electrolysis of a solution of a salt is directly proportional to the valency of the ion. With these earlier conclusions as a basis, the electrochemical theory was revived by Helmholtz. The theory had many adherents during the latter part of the 19th century. The corpuscular or electronic theory formulated by J. J. Thomson starts with the assumption that corpuscles or electrons are constituents of all atoms; so that the chief difference between one atom and another is not one of quality — since all atoms contain electrons — but is a difference of quantity, and of distribution or arrangement. The electrons carry minus charges of electricity, and yet they are ordinarily present in a neutral atom. This being the case, we should look for a corresponding positive charge, somewhere in the atom, and the hypothesis has been brought forward that the positive charges constitute the nucleus of the atom. When two electronic systems, e.g., that of hydrogen and chlorine, come into contact, one of the electrons gets detached from the atom and describes an orbit around the other atom. Each atom was originally neutral; but the system from which the electron was removed becomes a positive atom, and the system to which the electron is added becomes a negative atom. This transfer of an electron then makes hydrogen a positive system and makes chlorine a negative system. Here we have a plausible explanation of the valency of an element. An atom minus one electron, or an atom plus one electron may be considered as electrically charged, and therefore capable of attracting oppositely charged atoms to form electrically neutral systems. An atom less two electrons, or, with two electrons in excess, would have twice the ability to combine. It would have the valency of two. Consult Friend, 'Theory of Valency'; Werner, 'Theory of Valency'; von Meyer, Ernst, 'History of Chemistry'; Freund, 'The Study of Chemical Composition'; Muir, Pattison, 'History of Chemical Theories and Laws'; Thomson 'Electricity and Matter'; Millikan, 'The Electron.'

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VALENS, vā'lĕnz, **Flavius,** Roman emperor of the East: b. near Cibalis, Pannonia, 328; d. Adrianople, 9 Aug. 378. He was declared at 36 the associate of his brother, Valentinian I, who made him emperor of the East. He subdued the revolt of Procopius and was frequently with the Goths under Athanaric, who were several times defeated, and sued for peace, which was granted them (370). In 377 the Goths, driven south by the Huns, asked and were allowed to settle on Roman territory, but the terms of the treaty not being faithfully observed by the subjects of Valens, they soon took up arms, and in 378 defeated Valens and destroyed the greater part of his army.

VALENTIA. See Valencia.

VALENTINE, Saint, a bishop and martyr of the Church, who was put to death at Rome for his faith during the persecution under Claudius II, 14 Feb. 270. The custom of choosing valentines on his day is of considerable antiquity, and it was an old belief that birds began to mate on this day. On the eve of Saint Valentine's day young people of both sexes used to meet, and each of them drew one by lot from a number of names of the opposite sex, which were put into a common receptacle. Each gentleman thus got a lady for his valentine, and became the valentine of a lady.

VALENTINE, Edward Virginius, American sculptor: b. Richmond, Va., 12 Nov. 1838. He studied anatomy at the Medical College of Virginia, and began his art training at Paris under Couture. He was subsequently a pupil under Bonaiuti in Italy, and Kiss in Germany; and attended the Royal Academy of Arts in Berlin. He was president of the Richmond Art Club and the Valentine Museum; vice-president of the Virginia Historical Society; and a member of several patriotic and secret organizations. His works include 'The Nation's Ward'; 'Unc' Henry'; 'Andromache and Astyanax'; 'The Blind Girl'; ideal figures 'Judas and Grief'; bronze busts of Commodore M. F. Maury, J. V. Minor, University of Virginia, of J. R. Tucker of Washington and Lee University, John S. Mosby, A. S. Johnston, W. P. Johnston; heroic bronze statues of Jefferson Davis and allegorical female figures, symbolical of the South for Richmond, Va., bronze statue of Gen. Hugh Mercer for the United States government; statue of Gen. R. E. Lee for Statuary Hall, Washington; statue of John J. Audubon for New Orleans.

VALENTINI, Philip Johann Joseph, American archæologist: b. Berlin, Germany, 1828; d. New York, 16 March 1899. He was of Italian parentage, was educated at the Gymnasium of Torgau and at the University of

Berlin, making a special study of philology and jurisprudence, and in 1854, under government auspices, founded the seaport Puerto Limon in Costa Rica. While thus engaged he learned that the natives had no knowledge of their ancestors, and on his return to Germany he made a thorough research concerning the history of early Spanish colonization in Central America. He later studied the prehistoric remains of Guatemala and the surrounding regions, and his 30 years' labor in deciphering the pre-Columbian manuscripts placed him in the front rank of American archæologists. An achievement which added much to his reputation was his interpretation of the famous Mexican calendar-stone, concerning which he published an account, 'The Mexican Calendar Stone' (1878). His other works include 'The Landa Alphabet' (1880); 'Two Mexican Chalchihuites' (1881); 'The Olmecas and the Tultecas' (1883); 'A Study of the Voyage of Pinzon to America' (1898), etc.

VALENTINIAN I, Flavius, Roman emperor: b. Cibalis, Pannonia, 321 A.D.; d. Bregetio, Germany, 17 Nov. 375. He entered the army and by his capacity and courage rose rapidly in rank under Constantius and Julian, and on the death of Jovian was chosen as his successor, 26 Feb. 364. He resigned the sovereignty of the East to his brother Valens (q.v.) and himself governed the West with ability till his death. He possessed great military skill and was a prudent administrator. His reign was occupied in campaigns against the barbarians along the borders of the empire. By his first wife he had Gratian and by the second, Justina, another son, Valentinian II, and three daughters, one of whom, Galla, became the wife of the Emperor Theodosius I. He was succeeded by Gratian and Valentinian II.

VALENTINIAN II, Flavius, Roman emperor: son of Valentinian I: b. 372 A.D.; d. 15 May 392. He was an infant of four years at the death of his father and received from his elder brother, Gratian, the provinces of Italy, Illyricum and Africa as his share of the Western empire. During his minority Gratian practically exercised supreme authority until his own death in 383. Maximus, the murderer of Gratian, paid no attention to Valentinian till 387, when he invaded Italy and Valentinian then fled to Thessalonica to seek aid of Theodosius, emperor of the East. Theodosius now governed in effect for Valentinian, who, while in Gaul, was murdered by Arbogastes, the commander-in-chief of his army.

VALENTINIAN III, Flavius Placidus, emperor of the West, grand-nephew of the preceding: b. about 419; d. 455. He was the son of Constantius III, by Placidia, the daughter of Theodosius the Great, and was seated on the throne of the West by Theodosius II, emperor of the East in 425. He was a weak prince, who never really ruled during the 30 years that he sat on the imperial throne; his mother, Placidia, governing for him till her death in 450. She was succeeded by the eunuch, Heraclius. Valentinian's treatment of Bonifacius made the latter adopt the cause of Genseric (q.v.), chief of the Vandals, and thus Africa was lost to the empire. Aetius, the buttress of his empire, the emperor stabbed to death in a fit of envious jealousy (454), but next year was himself slain by Maximus, whose wife he had ravished. Valentinian was the last of the Theodosian line. Fletcher's powerful tragedy of 'Valentinian,' produced before 1618 but not printed till 1647, was founded upon events in the life of this monarch. Consult 'Cambridge Mediæval History' (New York 1911).

VALENTINIANS, the followers of Valentinus, an Alexandrian gnostic, who in 141 went to Rome, where he actively disseminated his views up to the year 160. He propounded that in the pleroma (q.v.) there were 15 male and as many female æons united in wedlock. The youngest æon, Sophia (Wisdom), brought forth a daughter, Achamoth, whence sprang the Demiurge, who created mankind. This Demiurge aspired to be regarded as the only god, and led many angels into the same error. To repress his insolence, Christ descended, Jesus, one of the highest æons, joining him when he was baptized in Jordan. The Demiurge had him crucified; but before his death both Jesus the Son of God and the rational soul of Christ had separated, leaving only the sentient soul and the ethereal body to suffer. The Valentinians were divided into many sects and schools. See GNOSTICISM.

VALENTINUS, văl-ĕn-tī-nŭs, **Basilus,** German alchemist: b. at the end of the 14th century. He appears in history as traveling through Spain, England and Holland, and in 1413 he retired to a Benedictine monastery at Erfurt. He was far in advance of his age in knowledge of chemistry. He distinguished between bismuth and zinc, produced pure quicksilver from sublimate of mercury and nitrate of quicksilver. His special investigations, however, were in relation to antimony, and the results he attained were accepted as ultimate for at least a century. He discovered muriatic acid, ammonia, fulminating powder, sugar of lead and formulated the earliest method of quantitative analysis. His works remained unpublished until (1677) a couple of centuries after his death, but they were known to Theophrastus Paracelsus, who appropriated as his own discoveries some of the scientific secrets which they revealed.

VALERA Y ALCALA GALIANO, Juan, hoo-ān' vā-lā' rā ē āl-kā-lā' gā-lē-ā'-nō, Spanish statesman and author: b. Cabra, near Cordova, 18 Oct. 1824; d. Madrid, 18 April 1905. He studied at Granada, turned from jurisprudence to a diplomatic career, and was secretary of legation successively at Naples, Lisbon, Rio de Janeiro, Dresden and Saint Petersburg. Then he returned to Spain and wrote for *El Contemporaneo,* the organ of the opposition to O'Donnell. In 1859 he became deputy, and Minister of Commerce and Agriculture. After serving as Ambassador at Frankfort, he took part in the Spanish revolution of 1868. Subsequently he was Ambassador to Lisbon, Washington (1884–86), Brussels, and Vienna. He was also made a member of the senate, the council of state and the Spanish Academy. While thus prominent in public affairs, his best efforts were nevertheless given to literature. His verse was finely wrought, but was criticized as the expression rather of wide culture than of poetic inspi-

ration, and his criticisms for a certain courtesy which interferes with a clear and impartial judgment. His work in prose fiction assured him a high place not only in Spanish but in general literature. His 'Pepita Jiménez' (1874) marked the revival of Spanish fiction, and the detachment from French patterns. His work steadily improved, and he treated with equal skill dialogue and description, the short story and the long. He was particularly praised for a "complete synthesis of gravity of matter and gaiety of manner." Among the titles of his further works were 'Las Ilusiones del Doctor Faustino' (1876); 'El Comendador Mendoza' (1877); 'Doña Luz' (1878); 'Pasarse de Listo' (1888); 'Estudios Criticos' (1864–84); 'Nuevos Estudios' (1884); 'La Buena Fama' (1895); 'Juanita la Largo' (1896); 'Genio y Figura' (1897); 'Morsamor' (1899); 'De Rios Argentinos' (1901); 'Ecos Argentinos' (1901); 'Florilegio de Poesias Castellanas del Siglo XIX,' Vols. I–III (1901–2); 'Poesias' (1858); 'Canciones, Romances, y Poemas' (1885). A collective edition appeared in 1885 in the 'Coleccion de Escritores Castellanos.' See PEPITA JIMENEZ. Consult Brunetière, 'La casuistique dans le roman de Juan Valera' in his series 'Histoire et litterature,' Vol. I.

VALERIAN, vă-lē-rĭ-ăn (PUBLIUS LUCINUS VALERIANUS), Roman emperor: b. about 190 A.D.; d. about 260 A.D. He was descended from a noble Roman family and rose by degrees to the highest offices in the state. When the Emperor Decius in 251 determined to revive the censorship, Valerian was chosen by him to occupy the post, but his death in 253 interrupted the plan and Valerian was chosen emperor. His reign was of slight importance, he accomplished little to avert the impending dissolution of the empire, and was almost constantly involved in warfare against the Persians and the barbarian tribes surrounding him. In 260 he was taken prisoner by the Persians and died in captivity. He was succeeded by his son Gallienus.

VALERIAN, the type genus (*Valeriana*) of the valerian family, herbs or shrubs having flowers with five-parted perianths, and funnel-shaped, short-spurred corollas, which are generally of a pale rose-color. The calyx, which is rudimentary, when in flower, becomes a feathery pappus at the top of the fruit. The leaves are simple or pinnate, without stipules, and the small blossoms are gathered into profusely branched cymose inflorescences, usually terminal. They have a spicy, aromatic odor, very grateful in spring, and are sometimes so fragrant, as in the case of *Valeriana sitchensis* and *V. officinalis* as to suggest heliotrope. The latter species is the common, or great wild valerian, which is cultivated in gardens for its flowers and its root. It has an erect stem, two to five feet tall, with pinnate leaves and toothed leaflets, and very fragrant flowers in pale tones of lavender, pink and white. The ascending rhizome, with many fibrous roots, has a peculiar, pungent and most disagreeable odor, due to the volatile oil of valerian contained in it, which grows stronger and worse when old. The taste is bitter, and like camphor, and the root is an officinal drug, which is a stimulant and anodyne, used in hysteria, and as an antispasmodic. Cats are very fond of the odor of valerian, and tear the plant to pieces and roll in it. They are said even to dig up the roots and devour them. A bit of the root is also used as a bait for catching rats. The carrot-like roots of *Valeriana edulis,* a tall glabrous plant of the western United States with undivided stem leaves, and yellowish-white flowers in elongated panicles, are eaten by the Indians either raw or dried. The Pah-Utes even grind them into flour and use it in the form of bread or mush. Nard is a name given to various species of valerian, but particularly to *V. celtica,* employed by Eastern nations as a substitute for spikenard in their scented baths; it is, likewise, called Celtic spikenard, and, like the Cretan spikenard (*Valeriana phu*), has medicinal properties similar to, but weaker than, the officinal valerian. The Greek valerian is *Polemonium cæruleum,* mistaken by old herbalists for the valerian described by the ancient Hellenes, and the name has been applied to the whole genus, including the creeping American *P. reptans,* with delicate nodding corymbs of pale blue flowers. *Centranthus ruber* is the scarlet lightning or spurred or red valerian, cultivated for its oblong panicle of scarlet flowers. The African or Algerian valerian (*Fedia cornucopiæ*) is used as a salad plant in Algeria. It is low, glabrous and branching, with oval leaves, and tubular, long, pink flowers. It can be cultivated and eaten like corn salad, but is not so hardy.

VALERIANOS, vă-lē-rĭ-ā'nŏs, **Apostolos.** See FUCA, JEAN DE.

VALERIC or **VALERIANIC ACID,** $C_4H_9CO_2H$. Four acids of this composition are known. The one ordinarily known by this name is a monobasic acid found free and as ethereal salts in the animal and vegetable kingdoms, chiefly in valerian and angelica roots. It may be made artificially by the oxidation of ordinary amyl alcohol by chromic acid mixture. It is a colorless oily liquid; lighter than water, and possessed of a peculiar odor and a sharp acrid taste; somewhat soluble in water but very easily so in alcohol; unites with bases to form salts called valerates or valerianates and with alcohols to form ethereal salts. These latter are frequently of a rather agreeable odor and taste and for such are much used in the preparation of artificial fruit essences. Some of the metallic valerianates are used in medicine because of their slight sedative action.

VALERIUS, Flaccus Setinus Balbus, flăk'ŭs sē-tī'nŭs bal'bŭs, **Caius,** Latin poet: b. Padua, lived in the time of Titus and Vespasian; d. about 90 A.D. He wrote and dedicated to Vespasian the 'Argonautica,' a poem in eight books, in which he narrates the adventures of Jason and his companions. This epic he left unfinished. He is merely a somewhat free translator of Apollonius Rhodius, whose work he tricks out with rhetorical flourishes, while in some passages he is so obscure as to be nearly unintelligible. Consult Langen, 'Valerii Flacci Argonautica cum notis' (1896).

VALERIUS, Publius, surnamed PUBLICOLA, Roman consul and general: d. 503 B.C. He was instrumental in the expulsion of the Tarquins, and when Tarquinius Collatinus was forced to resign Valerius was elected consul in his stead in conjunction with Junius Brutus. When the Tarquins, aided by the Veientes,

moved against Rome in 509 B.C. they were met by the Romans under the two consuls and defeated. Brutus fell in the battle leaving Valerius sole consul. He promulgated a law by which any person who attempted to usurp kingly power might be killed by any one, and another establishing the right of a plebeian condemned by a magistrate to appeal to the people. In recognition of his services he received the surname publicola, "the people's friend." He was three times re-elected consul, conducted the expedition of Porsena, and with his colleague, Titus Lucretius Tricipitinus defeated the Sabines in 504. He is mentioned by Livy. His life was written by Plutarch.

VALERIUS ANTIAS, vă-lē'rĭ-ŭs ăn'tĭ-ăs, Roman historian. He lived in the middle of the 1st century of our era and his work was an account of Latin history from the founding of Rome, and comprised 37 books. It abounds in exaggeration and fabulous incident. The author draws largely on Livy, as far as that author extends. The disjected remains of Antias are published in Peter's 'Historicorum Romanorum Fragmenta' (1883).

VALERIUS CATO, kā'tō, Publius, Latin poet. He appears to have been born in Cisalpine Gaul in the 1st century B.C. During the dictatorship of Sulla, and the confusion caused by the proscriptions, he lost his estate, being then in his minority, and went to Rome as a needy student, although his talent as a critic and grammarian of the Alexandrian type eventually won him credit and distinction. Two poems, 'Diræ' and 'Lydia,' which long passed under Virgil's name, have been attributed to him on somewhat doubtful evidence. Consult Ribbeck, 'Appendix Vergiliana' (1895).

VALERIUS CORVUS, kôr'vŭs, **Marcus,** Roman general: b. about 371 B.C., d. about 271. In 349, being military tribune under Camillus in his campaign against the Gauls, he accepted the challenge of a gigantic warrior to single combat, and killed his antagonist with the assistance of a raven which perched upon the helmet of Valerius and as often as he advanced upon his foe flew at the Gaul's face. A general battle then ensued, in which the Romans were completely victorious. From this circumstance Valerius was considered one of the greatest of Roman heroes and was given the surname of Corvus (a raven). He was made consul the next year, and the same honor was conferred upon him five times afterward. In his third consulship, at the age of 29, he gained two victories over the Samnites at Mount Gaurus and at Suessula. In 342 he was appointed dictator on his quelling through his personal popularity a mutiny in the army. He was dictator again in 301, when he defeated the Marsi and Etruscans. He held curule dignities 21 times, repeatedly enjoyed the honors of a triumph, and is referred to by the Roman writers as an example of the favors of fortune.

VALERIUS MAXIMUS, măk'sĭ-mŭs, Roman author of the 1st century A.D. Nothing is known of his life except that he accompanied Sextus Pompey into Asia. His name is appended to a collection of historical anecdotes entitled 'De Factis Dictisque Memorabilibus Libri IX,' which embraces a large variety of subjects, and as a historical authority is of some value. Abridgments were made by Titus Probus, Julius Paris and Januarius Nepotianus. Those of the two last named were discovered by Cardinal Mai in the library of the Vatican. Appended to the work of Valerius Maximus is a fragment entitled 'De Nominibus Prænominibus, Cognominibus, Agnominibus, Appellationibus, Verbis,' of which the first chapter only is extant. It professes to be an epitome made by Julius Paris, but probably had no connection with the work of Valerius. The best editions of Valerius Maximus are those of Torrenius (1726); Hase (1822); Kemp (1854); Halm (1865). The work was translated into English by Speed (1698).

VALERIUS PROBUS. See PROBUS, MARCUS VALERIUS.

VALETTA, văl-lĕt'tă, a fortified Mediterranean seaport, capital of Malta (q.v.), on the northeast coast of the island, picturesquely situated on an elevated peninsula, with a large and commodious harbor on each side. The streets are narrow, the squares are spacious and handsome, and the splendid quays are lined with elegant buildings. Owing to the inequality of the site the different streets connect by flights of steps. The cathedral, built in 1580, contains the tombs of the Knights of Malta, who are represented in white marble in full costume. The governor's residence, the ancient palace of the grand masters, has a corridor hung with portraits of knights, and an armory rich in trophies and ancient armor. A library and museum, a university, a botanical garden, a military hospital, occupying a noble building erected by the knights, and other public institutions, are notable features. There are several dry-docks and the town is an important coaling station. It has a stone quarry, silk factories, a large transit trade and is the chief station of the British fleet in the Mediterranean. Over 100 vessels are registered from this port, one-third of them steamships. Pop. 25,000.

VALETTE, Jean Parisot de la, zhŏn pä-rē-sō dė lä vă-lĕt, French soldier: b. Toulouse, 1494; d. Valetta, Malta, 28 Aug. 1568. He came of a noble family of Toulouse, early entered the order of the Knights of Saint John and was elected grand master of that order in 1557. His after career was a series of exploits in warfare with the Turks, ending with his renowned defense of Malta, lasting from 18 May 1565 till 8 September. The Turkish armament included 159 war ships and 30,000 men; while the defenders were 8,500 men, with 700 knights, who held the fortifications heroically in spite of awful loss and privations, till the siege was raised on the approach of a Neapolitan fleet. Valette was the founder of Valetta (q.v.).

VALHALLA. The abode of Odin as described in Norse mythology. It was the house of joy and of vast proportions, being reported as having 540 entrances, each so broad that 800 heroes could march through abreast. Also the Pantheon, or Temple of Fame, built by Louis I of Bavaria, at Donaustauf, near Ratisbon, and consecrated to all Germans who have become renowned in war, statesmanship, literature and art. Also applied generally to buildings dedicated to national heroes or the distinguished dead in various fields.

VALISE. See TRUNK.

VALKYRIES, väl-ki'rēz ("Battle-Maidens"; "Shield or Wish-maidens"), in Norse mythology, beautiful and alluring women who ride through the air clad in gleaming armor and jewels of gold, lead the battle and select the Val or Einherjar, single champions worthy of Wodin and of entrance into Walhalla. From the manes of their horses (the clouds) cords are trailing and the points of their spears scatter sparks of light. They lead the fallen heroes to Walhalla and offer them there the drinking horn. Sometimes they are of supernatural origin; sometimes the daughters of princes; they can change themselves into swans at will. They sometimes take noble heroes to be their lovers. Brunhilde in the heroic poetry of the north is a Valkyrie. Most of the names of the Valkyries contain some reference to war and battle. (See SCANDINAVIAN LANGUAGE AND LITERATURE). Consult Golther, 'Der Valkyrienmythus' (1889).

VALLA, väl'lä, **Laurentius** (LORENZO DELLA VALLE), an Italian humanist: b. Rome, 1407; d. there, 1 Aug. 1457. He studied Greek and Latin under Bruni and Arispa, took orders in 1431 and was appointed professor in the University of Pavia the same year. Subsequently to 1433 he held the same office in Milan, Genoa and Florence, and in 1442 became secretary to Alfonso V of Naples. Pope Nicholas V summoned him to Rome and made him secretary and apostolic writer (1447); and he passed his remaining years in translating from the Greek, and in furious literary feuds with Poggio, Trapezuntios and others among his compeers. He was a born controversialist and reckless in the utterance of his views. He condemned moral standards of ecclesiastical asceticism in his 'De Voluptate Dialogus' (1431); he assailed the scholastic logic of the Middle Ages in his 'Repastinatio Dialectices'; the use of unclassical words and idioms in Latin writing was criticized in his 'Elegantiæ Latini Sermonis' (1471); and the claims of the papacy to temporal dominion were attacked in his 'De Falso Credita et Mentita Constantini Donatione Declamatio' (1440). He wrote numerous other tractates of a destructively critical character, and made himself especially obnoxious to the professors of the current theology by his 'Annotationes in Novum Testamentum' (afterward edited by Erasmus), in which he attacked with much acrimony the Vulgate's translation of the Gospels and Epistles. His translation of Thucydides and Herodotus into Latin are not without authority at the present day. Consult Barozzi and Sabbadini, 'Studi sul Panormita e sul Valla' (1891); Mancini, 'Vita di Lorenzo Valla (1892); Wolff, 'Lorenzo Valla, Sein Leben und seine Werke' (1893).

VALLABHACHARYA, väl-la-bä-kä'rē-ä, a Hindu religious reformer. He flourished in the 15th century, and his followers are most influential at the present day. He is regarded as a Mahatma, or incarnation of Vishnu; and his descendants, under the title of Maharajah, or Gosain, are treated with almost divine honors. He inculcated the worship of Vishnu by his name of Krishna, in which form the god, like the Greek Zeus, did not disdain the love and company of mortal maidens. The worship of Krishna has a tendency to licentiousness, and a reaction toward a more spiritual and exalted creed set in under Swami, Narayan about 100 years ago. Consult Mulji, 'History of the Sect of Maharajahs or Vallabhacharyas in Western India' (1865); Williams, 'Hinduism' (1877)..

VALLADOLID, väl-yä-thō-lēth', Mexico. See MORELIA.

VALLADOLID, Philippines, pueblo, province of Negros Occidental; on the west coast on Guimaras Strait, 16 miles south of Bacólod. Pop. 14,000.

VALLADOLID, Spain, (1) Capital of the modern province of the same name, a garrison town, and archiepiscopal see, on the left bank of the Pisuerga, a tributary of the Douro, at the confluence of the Esgueva (largely covered in) from the east, and the Canal of Castile from the north, 100 miles northwest of Madrid. It is situated in a spacious, fertile plain and has fine streets and squares. The Plaza Mayor or de la Constitucion is the centre of the city's life. The cathedral, begun in late Renaissance style in 1585, is still unfinished; the most interesting church is that of Santa Maria la Antigua, dating from the 12th century. Close to these two edifices stands the university, a 17th century building, with a library. Other noteworthy buildings and institutions are the Colegio de Santa Cruz, a splendid plateresque building of the 15th century, containing a museum and some modern paintings; the Colegio de San Gregorio, a 15th century building, now devoted to municipal purposes, with a splendid Gothic façade; the 13th century church of San Pablo, with an ornamental Gothic façade; the royal palace, dating from the 17th century; the Convent of San Benito, now used as a barrack; two theatres; a bull-ring; general hospital, etc. The Campo Grande is the finest park of the city. The industries include iron-founding and manufactures of cloth, silks, paper, gold and silver wares, chemicals and leather. Valladolid was the capital of Spain before Madrid. It is the birthplace of Philip II and contains the house in which Columbus died. One of the foreign institutions for the training of Scottish Roman Catholic priests was formerly situated here. Pop. (1910) 71,066. (2) The province has an area of 2,922 square miles and is an agricultural region. It was formerly noted for its weaving and tanneries, but all industry has declined of late. Pop. about 300,000. See CASTILE.

VALLADOLID LA NUEVA, lä nwä'vä, Honduras. See COMAYAGUA.

VALLANDIGHAM, Clement Laird, American politician: b. New Lisbon, Ohio, 29 July 1820; d. Hamilton, Ohio, 17 June 1871. He was educated at Jefferson College, Pa., and was admitted to the bar in 1842. More inclined to a political than legal career, at 25 he became the representative of Columbiana County in the legislature of Ohio. In 1847 he removed to Dayton, Ohio, which he made his permanent home, and took charge of *The Empire*, a Democratic newspaper, which he edited with marked ability for two years. He returned to his profession in 1849, but sought political honors, and after two defeats was elected to the House of Representatives in 1856; was re-elected in 1858, and was in Congress at the outbreak of the

Civil War. He strenuously opposed the war as being unnecessary and unconstitutional, and his opposition was radical and persistent.

Failing of election to Congress in 1863, he returned to Ohio, and at political meetings opposed and denounced the government and the war policy in such bitter terms, that he became the most prominent leader of the so-called «Copperheads» of the North. His extreme opposition to the war led to his arrest in May 1863 at Dayton, by General Burnside, commanding the military department of the Ohio. He was tried by a military commission at Cincinnati, Ohio, for disloyal utterances and conduct, found guilty and sentenced to close confinement during the war, but President Lincoln commuted the sentence to banishment beyond the Federal lines, and he was sent south through General Rosecrans' camp at Murfreesboro into the Confederate lines. Being unwilling to espouse the cause of the Confederacy and dissatisfied with his reception in the South, in a short time he ran the blockade from Wilmington, N. C., and proceeded by sea to Halifax, and later to Windsor, Canada, where he made his home for a time. While at Windsor he was nominated by the Democrats of Ohio for governor, against the Hon. John Brough, and was defeated by over 100,000 majority. In 1864 he returned to his home at Dayton without molestation, and took an active part in various political campaigns in Ohio, becoming a delegate to the National Democratic Convention at Chicago.

His tragic death occurred while he was engaged as attorney in a murder case. He was illustrating to the jury the manner in which the victim was shot, when by accident he fatally shot himself with the pistol he held in his hands. Vallandigham was an accomplished and forcible speaker. His style was formed from the best models of oratory. His convictions were strong and inflexible, his integrity and courage undoubted. Consult Vallandigham, J. L., 'Life of Clement L. Vallandigham' (1872).

VALLE, vä-lā, Pietro della: b. 1586; d. 1652; a noted Italian traveler born of noble family. He is credited with being the first investigator to begin that long line of research which finally led to the discovery of the records of the ancient civilization of Assyria and the deciphering of its records. During his travels he wrote back learned and interesting letters to his friend Mario Schipano, professor of medicine in Naples. He spoke Persian, Arabian, Coptic and Turkish and these languages were of great use to him in his travels during which he visited Persia, where he was well received at court in 1617 and remained for several years which were spent in the study of the country. On one of his expeditions he visited the ancient ruins of Persepolis which he examined and described with more care and intelligence than had ever been bestowed upon them by any previous explorer. He copied some of the ancient cuniform writing and discussed the characters employed in it. His letters called the attention of the world to this mysterious ancient field and created an interest which was destined never to die wholly out until the riddle of its past had been solved. Della Valle's work possesses great value for he describes with exactness and intelligence the countries through which he traveled which include Persia, India, Egypt, Turkey, Arabia and the Holy Land. It was only in 1526 that he returned to Italy after an absence of almost 10 years.

VALLEJO, väl-yā'hō, Cal., city in Solano County, on Napa Creek, an arm of San Pablo Bay, and on the Southern Pacific Railroad, about 25 miles northeast of San Francisco and opposite Mare Island Navy Yard. The city was founded in 1851 and was intended for the capital of the State. The legislature held sessions here in 1851, 1852 and 1853, but only a part of the session of 1853 was held in Vallejo. In 1866 the city was chartered. It is in a fertile agricultural section and nearby is a quicksilver mine. The chief manufactures are flour, leather, cement, canned fish, lumber products and canned fruits. Mare Island Navy Yard, where about 5,000 men are employed, contributes to the prosperity of the city. The principal buildings are the city hall, the Sailors' Club House, the church and school buildings. The educational institutions are two high schools, one public, founded in 1870, the other Saint Vincent's Academy (Roman Catholic), public and parish elementary schools and Carnegie Free Library. There is one Home for Orphans. The city owns and operates the waterworks. The government of Vallejo, like that of Berkeley, Monterey, Oakland, San Diego, Santa Cruz and other California cities is conducted on the commission plan. Pop. about 15,000.

VALLENTINE, Benjamin Bennaton, «FITZNOODLE,» American journalist and dramatist; b. London, England, 7 Sept. 1843. He studied for the English bar and coming to this country was one of the founders of *Puck* and its editor 1877–84; and dramatic critic of New York *Herald*. He is the author of 'The Fitznoodle Papers'; 'Fitznoodle in America'; and such plays as 'A Southern Romance'; 'In Paradise'; and 'Fitz in New York.'

VALLEY CITY, N. D., city, county-seat of Barnes County, on the Cheyenne River, and on the Union Pacific and the Minneapolis, Saint Paul and Sault Sainte Marie railroads, about 55 miles west of Fargo. It is in an agricultural and stock-raising region. The industries are connected chiefly with farm products and the shipment of livestock, and the city is a distributing centre for quite an extensive region. The educational institutions are the State Normal School, public graded schools and a school library. There are good banking facilities and newspapers. Pop. 4,600.

VALLEY FALLS, Kan., city in Jefferson County, on the Kansas City Northern, the Union Pacific and Atchison, Topeka and Santa Fé railroads, about 30 miles west of Leavenworth and 26 miles north of Topeka. It is in a fertile agricultural region. The river furnishes excellent water power, and the chief manufactories are flour-mills, machine shop, and agricultural implement shop. There are two State banks. Pop. about 1,480.

VALLEY FORGE, Pa., village in Chester County, on the Schuylkill River, and on the Philadelphia and Reading Railroad, 24 miles west of Philadelphia. Valley Forge is noted as the place where Washington and his army of about 11,000 men went into winter quarters, 17

Dec. 1777, after the occupancy of Philadelphia by the British. The army suffered cold and hunger on account of the poverty of the country, but perhaps more from the incompetency of the commissary department. Despite the consequent illness of many of the men, Baron Steuben, who had been made inspector-general of the army, drilled and trained the soldiers and reorganized the army. Washington was at Valley Forge when he received the news of the consummation of the alliance with France. Washington abandoned the camp 18 June 1778, and again took possession of Philadelphia. In 1893 the Pennsylvania legislature took steps to acquire and preserve Valley Forge as a public park and historic landmark. On 19 Oct. 1901, a monument was here unveiled by the Daughters of the Revolution in memory of the soldiers who died in camp during the winter of 1777–78. The entire field at Valley Forge is practically the same to-day as it was when evacuated by Washington in 1778. The trenches thrown up by the "ragged Continentals" may still be seen. The old stone house which Washington used for his headquarters is standing and is in a good state of preservation. In 1903 the matter of making Valley Forge a State park was again taken up by the legislature of Pennsylvania, and the sum of $74,500 was appropriated for the purpose. To the 210 acres already owned by the State 800 acres were added.

VALLEY JUNCTION, Iowa, city in Polk County, on the Chicago, Rock Island and Pacific, and the Minneapolis and Saint Louis railroads, about five miles west of Des Moines. It has coal mines, cement works, extensive railroad repair shops and stock yards. Pop. about 3,200.

VALLEY QUAIL. See QUAIL.

VALLEY TRAINS, stratified deposits filling valleys, and laid down by overloaded streams flowing from the melting ice fronts of glaciers. Such deposits, when more widely spread over a region, and not confined to valleys, are called outwash plains. The latter are often many miles in extent, and are now accumulating at many points along glacial fronts in Alaska.

VALLEYFIELD, or SALAHERRY DE VALLEYFIELD, Canada, a town and port of entry in Beauharnois County, on the Saint Lawrence River, and at the head of Beauharnois Canal constructed past the Saint Lawrence rapids, 30 miles by the Grand Trunk Railway southwest of Montreal. The river here is crossed by a splendid railway bridge. Valleyfield is the see of a Roman Catholic bishop, and has a cathedral, college and other fine public institutions. The town is electrically lighted, has abundant water power waterworks, and flouring-, paper-, and cotton-mills, one of the latter establishments employing 1,500 persons. Pop. 13,000.

VALLEYS, in general, depressions of some magnitude in the surface of the land. Two great classes of valleys may be recognized,—(1) structural, and (2) erosional. The former include depressions due to folding, such as synclines; basins due to subsidence of an area such as might occur in regions of subterranean drainage, or in volcanic regions; fault valleys which when narrow gorges, like that of the Rhine, are known by the term of "graben," and others. Erosion valleys embrace by far the more common types, such as river valleys, which range from gorges with vertical sides and completely filled by the river, to depressions many miles in width, with flat bottoms and gently sloping sides. These are carved wholly by the rivers that occupy them. The larger valleys of this type are generally found along the border line between ancient more or less disturbed, and more modern coastal plain strata which lap up against the older ones. By continued erosion the edge of the newer strata is pushed further and further away from the older land, until a valley of great width is produced along the strike of the strata. Valleys of this type are well developed along the Atlantic Coast, next to the crystalline rocks of the Piedmont district. Some valleys of this type have suffered drowning, as appears to be the case in Long Island Sound. Other valleys of this type have become filled with water and transformed into lakes by the stopping up — by glacial drift or warping of the land of their outlets. Such is the case with the valleys now holding the water of some of our Great Lakes, notably Ontario. Vallevs due to glacial erosion are not uncommon, although it is probable that glaciers usually do little more than deepen valleys originally formed by streams. A type not included in the two divisions mentioned is found in intra-morainal valleys within the glaciated region. Here the valley is the remnant of the plain around which hills of glacial drift are built. See MOUNTAIN; FLOOD PLAINS.

VALLISNERIA, the typical genus of the tape-grass family. It is composed of aquatic plants, *V. spiralis* being the tape-grass or eel-grass, whose long submerged leaves are detested by swimmers; in Chesapeake Bay it is the "wild celery," upon the roots of which the canvas-back feeds, and to which are due the admirable flavor of that duck. The leaves are very long and narrow, and float just under the surface in shallow water, the plant being rooted in mud or sand. It spreads widely by stolons, so that it often forms a wide belt along the shore, which is a great refuge for the small fry of water-life, but greatly impedes the passage of boats. *Vallisneria* is peculiar in its arrangements for cross-fertilization. The leaves are arranged in fascicles, from the axils of which spring the flowers, only one sex on each plant. They are enclosed in a kind of bladder formed by two membranous, concave bracts. There is only one pistillate flower to a bladder, and when ready for fertilization, the envelope splits and frees this flower, its ovary elongates, and it is pushed upward by the growing stalk, until the whorl of three lanceolate sepals floats on the surface. Above them are three abortive petals, and three stigmas, by-lobed at the apices, and fringed on the edges. They project slightly between the sepals. In the meantime, the bladder about the staminate flowers, which are numerous, on a short axis, and have never risen far above the mud, becomes disrupted, and the flowers, which are globular, and have their three sepals closed tightly over the stamens, float like bubbles to the surface. There they drift about, and soon open. The arched sepals become reflexed, until they look like three boats

tied close together at one end. Two stamens project obliquely from the point of union, tipped with masses of sticky pollen-cells. These tiny crafts are blown about by the winds, and carried by currents, on the surface of the water, sometimes covering it as with a creamy film. In the course of their travels, they almost inevitably strike against the waiting pistillate flowers, riding at anchor, with their three stigmas poised at exactly the angle to allow their fringes to detach the sticky pollen-masses from the other flower. As soon as the pollen adheres firmly to the stigmas, the pistillate flowers are withdrawn beneath the surface by the contraction of the long stalks, which assume a spiral form, and ultimately ripen fruit near the muddy floor of the stream.

HELEN INGERSOLL.

VALLOMBROSA, väl-lŏm-brō'sä (Italian, "shady valley"), Italy, a celebrated abbey situated in a thickly wooded valley of the Apennines, about 18 miles southeast of Florence. It was founded by San Giovanni Gualberto about 1038, subject to the rule of Saint Benedict, and the institution was approved by Pope Alexander II in 1070. The original purpose of the founder was to establish separate hermitages, but a monastic mode of life soon began to prevail. The Order of Vallombrosa was strictly contemplative, was the first to admit lay brethren, and established 60 branch houses in Italy and France. The abbey acquired celebrity from its romantic situation, and its magnificent buildings were erected in 1637. It was a place of refuge for French priests during the first revolution; in 1808 it was pillaged by Napoleon. It was appropriated in 1866 by the Italian government and the building is now occupied as a school of forestry, although some monks still reside here and attend to the meteorological observatory established in 1654. The place is much visited on account of its fine scenery and the views it commands, and there are hotels for the accommodation of visitors. Vallombrosa has been celebrated by Dante and Ariosto, and the Miltonian quotation "thick as autumnal leaves that strew the brooks in Vallombrosa" is well known.

VALOIS, väl-wä, **House of,** a younger branch of the Capetian dynasty, which occupied the throne of France from 1328 to 1589. On the death of Charles IV, the last of the direct line of Capetians, his cousin Philip of Valois, the grandson of Philip III and great-grandson of Louis IX, was acknowledged king as the next male heir. His direct successors were John (1350–64), Charles V (1364–80), Charles VI (1380–1422), Charles VII (1422–61), Louis XI (1461–83), and Charles VIII (1483–98). The last named, dying without male issue, was succeeded by his cousin Louis of Orleans, the great-grandson of Charles V, who ascended the throne as Louis XII (1498–1515). Like his predecessor, he left no son, and had for his heir his cousin Francis of Angoulême, the offspring of a younger branch of the family of Valois-Orleans, who became King Francis I (1515–47). After him his son, Henry II (1547–59), and his three grandsons, Francis II (1559–60), Charles IX (1560–74), and Henry III (1574–89), held the sceptre, which, on the death of the last, passed into the hands of the Bourbon family, under Henry IV. These two centuries and a half are among the most disastrous in the history of France. See FRANCE — *History,* and individual titles.

VALORIZATION, val-er-i-za-shun. Act or Process of attempting to give an arbitrary market value or price to a commodity by governmental interference, as by maintaining a purchasing fund, making loans to producers to enable them to hold their products, etc., used chiefly of such action to Brazil.

VALPARAISO, Chile, province of the middle zone of the republic, bounded north by Aconcagua, south by Santiago, east by Santiago and Aconcagua, and west by the Pacific. It has an area of 1,775 square miles and includes the island of Juan Fernandez. The surface to the north is fertile and agriculture is successfully followed there. The south is mountainous and barren. The climate is exceptionally mild and uniform in temperature, the summer mean being about 63° and the winter 53°. Pop. 340,347 or 191.74 to the square mile. The capital is Valparaiso (q.v.).

VALPARAISO, väl-pą-rī'sō (Sp. väl-pä-rä-ē'sō), Chile, the most important seaport of the republic and a centre of trade for a large part of southwestern South America. It is located on a large bay about 75 miles west by north of Santiago. The leading industries are iron foundries and machine shops, factories for making macaroni, soap, shoes, perfumery, furniture, etc. There are also tanneries and woodworking plants. There are seven banks, including a branch of the National City Bank of New York, several daily newspapers, fine department stores, and more than 1,000 business houses enumerated in the city directory. There is an active chamber of commerce, and trade with North America is increasing steadily since the opening of the Panama Canal. There are large floating docks for repairing vessels at the port. Statues of Columbus and Lord Cochrane, Earl of Dundonald, who founded the Chilean navy, stand in conspicuous squares. The water supply is excellent. The city is the western terminal of the railway to Buenos Aires, completed in 1910. There are also railroads to Santiago and Los Andes. There are ocean cables and wireless telegraph stations. The harbor is excellent, and the entrances to the bay well fortified. It was the first city in South America to establish telegraph lines and to adopt gas (1856), to build aqueducts for the water supply, to use street cars (1860), etc. It has experienced several severe earthquakes. On 16 Aug. 1906, and for several days following, earthquakes and fire caused a large amount of damage to the city and surrounding towns, the greater part of the damage being done by the fire which started immediately after the first shock at 7.52 P.M. The climate is temperate. Pop. about 144,000.

VALPARAISO, Ind., city, county-seat of Porter County, on the Chicago and Grand Trunk, the New York, Chicago and Saint Louis, and the Pittsburgh, Fort Wayne and Chicago railroads, about 40 miles southeast of Chicago. It was settled in 1836 and in 1856 was incorporated. It is in a fertile agricultural section, and has a large trade in farm products. The chief manufactures are mica paint, dairy products, and machine-shop products. The city is

famous for its large school called the Northern Indiana Normal School, and known also as Valparaiso University, a great institution founded by Henry B. Brown in 1873. Its courses of study are planned to meet the needs of a large number of men and women who do not find the regular college courses available. In 1917 there were about 5,500 pupils enrolled, and the faculty and instructors numbered 220; the productive funds totaled $134,000, and the total annual income was $208,338. There are two national and one State bank, with deposits close to $2,000,000. The government is vested in a mayor, who holds office four years, and a common council. Pop. 8,000.

VALUE. Value is the most important word in the whole science of economics. Fundamentally it means the esteem in which a thing is held, but under ordinary commercial conditions it means power in exchange. There is no contradiction between these two ideas, because the higher the esteem in which a thing is held, the greater will be its power in exchange under normal conditions. Under certain abnormal conditions this would not be true. Travelers in a desert who are dying of thirst might esteem water very highly, but if they had nothing to give in exchange for it, water would have very little power in exchange, even if some one came along with a supply of water. The citing of such abnormal cases as this, however, does not go very far toward clearing up the subject of value. On the ordinary market, in the ordinary commercial community, there are always many things to give in exchange for any commodity that happens to be offered; and if the commodity which is offered is highly esteemed or intensely desired, many things usually will be offered in exchange for it. If it is held in low esteem, or not intensely desired, few things will be offered in exchange for it.

When we say that value in an ordinary commercial community is power in exchange, we must not be understood as saying it is merely a ratio of exchange. Power in exchange is power to command other desirable things in peaceful and voluntary exchange. When things are exchanged, however, they must of necessity be exchanged in some ratio, but the ratio is purely accidental and is not the real essence of value.

Value depends upon two things and two things alone: namely desirability and scarcity. Any material thing which can be transferred will have value if it possesses both these qualities and will have no value if it lacks either of them. However scarce or rare a thing may be, if nobody desires it, of course it will have no value or power in exchange. However desirable it may be in itself, if every one has all he wants of it, nobody will pay a price to get any more. Consequently it will have no power in exchange.

With a given degree of scarcity, the more desirable the object is, the higher its value, and the less desirable it is, the lower its value. At the same time, with a given degree of desirability the greater its scarcity, the greater its value; and the less its scarcity or the greater its abundance, the lower its value. That is to say, when everybody has nearly as much as he wants, he will not be very anxious to get any more, and he will not be anxious to pay a high price or give much in exchange for an additional quantity. But if it is very scarce, so that every one would like to have a great deal more than he has got, then he will give a great deal in exchange for it.

The reason why scarcity makes for high value and abundance for low value is mainly physiological. Wants are satiable. When one has had little food, hunger or the desire for food is intense. When one has had much food, hunger or the desire for food is less intense and gradually approaches the point of satiety, or actually reaches it. This is true not only of hunger but of every other human desire,—that is, for the desire for every other specific form of satisfaction. Even music palls, especially if there is little variety. One becomes weary of looking at the same work of art or at works of art of a given type. Were it not for this principle of satiety, there is no reason why the value of a commodity should diminish as the supply increases. If the tenth apple consumed by a given person furnished as much satisfaction as the first, there is no reason why the tenfold increase in the supply of apples should not sell at as high a price per barrel as the smaller supply.

This principle of valuation as suggested above rests upon physiology and not upon social arrangements. The law of demand and supply is much deeper than the organization of the market, the type of government, or the organization of society itself. It has its basis in human physiology. Market values and prices are only expressions of this fundamental physiological law. See ECONOMICS.

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VALVASSOR. See VAVASOUR.

VALVE TERMS. The accompanying list of mechanical terms includes nearly all of the principal terms generally applied to define the construction and use of the various forms of valves; but for specific information relative to the application of these devices to particular machines, see articles in this Encyclopedia under the titles AIR COMPRESSORS; BOILERS; BOILER TERMS; GAS; LOCOMOTIVE, THE; LOCOMOTIVE ENGINE, THE; LOCOMOTIVE, DESIGN AND CONSTRUCTION OF THE MODERN; PUMPS AND PUMPING MACHINERY; STEAM AND STEAM ENGINES; VALVES AND HYDRANTS.

ALLEN VALVE.— A form of slide valve, designed to give a very rapid and full port opening. Together with the plain D-valve, it forms one of the two principal types of slide valves in use.

ANGLE VALVE or CORNER VALVE.— One which is set at the angle of a pipe. It is either screwed or flanged.

ANNULAR SEATING.— A ring upon which a circular valve rests.

ANNULAR VALVE.— A disc valve which rests upon an annular seating.

BACK CUT-OFF VALVE.— A plate which slides on the back face of the main slide valve of an engine or motor, to regulate the cut-off point, and control the grade of expansion of steam. It is operated independently of the main slide of the engine by a separate eccentric capable of adjustment to the steam passages in the main slide.

BACK-PRESSURE VALVE.— A valve used for preventing the return of a fluid into a pipe. A check-valve.

BALANCED VALVE.— An equilibrium valve.

BALL VALVE.— A globular shaped lift valve with an annular seating. It is used in quick-running pumps, as it continually shifts its position on its axis, and therefore wears uniformly. It is made in two parts, one upper and one lower, which are screwed together after the insertion of the ball.

BLOW-OFF VALVE, or BLOW-OFF COCK.— A valve or plug-cock situated at the lowest part of a steam boiler, by which the lower portion of the contained water is periodically blown off or emptied, to prevent incrustation.

BLOW-THROUGH VALVE.— A valve used with a condensing marine engine to clear the cylinder, condenser, and air pump of the contained air, which is then replaced by steam, which being immediately condensed, creates a vacuum and enables the starting of the engine. When opened, it makes a communication between the steam in the valve casing and the condenser.

BONNETED SAFETY VALVE.— A valve covered with a bonnet or casing, and connected to a waste pipe by which steam is conveyed out of a building, when the boiler is closely roofed-in. The bonnet prevents the steam from filling the building or boiler shed. A box safety valve.

BRIDLE.— The loop forged on a slide valve rod, or the strips in a steam chest between which the valve travels.

BRINE VALVE.— The blow-off valve of a marine boiler.

BUCKET VALVE.— The flap valve of the bucket of a lift pump.

BUTTERFLY VALVE.— A pair of flap valves arranged back to back.

CAGE VALVE.— A ball valve.

CHANGE VALVE.— A slide valve used on hydraulic cranes for directing the pressure into two or more cylinders at will, singly or in combination, to obtain varying degrees of power, according to the load to be raised.

CHECK VALVE.— A wing valve inserted in a feed pipe between the boiler and the feed pump of an engine, to prevent the water returning from the boiler to the pump. The pressure of the water from the pump opens it toward the boiler, but the pressure from the boiler closes it toward the pump.

CIRCULAR VALVE.— A valve circular in plan, as distinguished from a slide valve.

COCK.— A cylindrical valve consisting of a shell, cover and plug. A passageway is cut through the plug, which when turned around opposite to the discharge and entrance openings, permits the fluid to pass through. When the openings of the passageway of the plug are brought opposite to the solid walls of the shell, the cock is closed. They are of various forms — bib, flanged, gland, socket, two-way, three-way, four-way and globe cocks. The term is sometimes applied to any valve that may be opened or closed by hand.

COMMON SLIDE VALVE.— The ordinary D slide valve in which the amount of the openings of the ports, both for admission and exhaust of steam, are equal, as distinguished from the exhaust relief valve.

CONICAL VALVE.— A valve of cone-shaped section, resting on an annular seating. It has no wings, but is sometimes used in the place of the common lift valves with parallel wings, as the lift valves of a pump.

CORLISS VALVE.— The valve of a Corliss engine. It forms the segment of a circle and rotates in an annular seating, alternately covering and uncovering the steam port. The supply valve is closed by means of a dash piston.

CORNISH VALVE.— A double-beat valve used in a Cornish engine.

CROSS VALVE.— A valve placed at the T formed by two pipes.

CUT-OFF VALVE.— A valve consisting of a solid plate, or one provided with cross bars and ports. It is the second valve in the arrangement for working steam expansively by means of a separate slide.

CYLINDER COCK.— A pet cock.

CYLINDER ESCAPE VALVE.— A valve attached to the cylinders of marine engines to allow the escape of the water of condensation and priming. It is supported by a spring and enclosed in a metal cap, which is provided as a protection for the engine attendants in case of a sudden blow-off of hot water.

COWBURN VALVE.— A dead-load safety valve, or a dead-weight safety valve.

DEAD-LOAD SAFETY VALVE.— A valve which is loaded by dropping annular weights over a cylindrical seating, the weight on the valve being increased or decreased according to the number of rings employed.

DELIVERY VALVE, or DISCHARGE VALVE.— The valve through which the contents of a pump are forced into the delivery pipe.

DISC VALVE.— A modified form of flap valve used in large pumps and in the air pumps of condensing engines. It consists of a rubber disc hinged at the centre, and resting on a perforated grid through which the water enters and lifts the valve. Its lifting movement is limited by a superimposed guard plate, hollowed in the upward direction.

DOUBLE-BEAT VALVE.— A circular lift valve with two seating faces by which steam is admitted on both sides at once. Also known as an equilibrium valve. It is extensively used on larger Cornish pumping engines.

DOUBLE DISC VALVE.— A valve consisting of a tapered plug having two faces fitting against two opposite seatings.

DRAIN COCK or DRAW COCK.— A pet cock.

D VALVE.— A term applied to the ordinary slide valve on account of its form, its face being hollowed out like a letter D.

EQUILIBRIUM SLIDE VALVE.— A slide valve provided with an equilibrium ring, that is a metallic ring attached to the back of the valve for the purpose of reducing the friction.

EQUILIBRIUM VALVE.— A valve in which the pressure on each face is so nearly equalized, that it moves with the minimum of friction and the least expenditure of power.

ESCAPE VALVE.— Same as Cylinder Escape Valve.

EXHAUST RELIEF VALVE.— A slide valve so constructed that the port is fully opened to exhaust, but only partially opened to steam.

EXPANSION VALVE.— An arrangement of two valves in the steam chest of an engine cylinder in which the steam is worked expansively. It consists of a main valve with a cut-off valve behind it.

FLAP VALVE.— A hinged valve, usually made of leather stiffened with iron or brass plates riveted in each face. Circular or rectangular in shape. Used in both the piston and the suction ends of the barrels of lifting pumps. The disc valve of an air pump is a flap valve hinged at the centre and lifting around the circumference.

FOOT VALVE.— The lowermost valve of a pump, or the valve at the aperture through which the water enters.

FOUR-WAY COCK.— A cock having four branches.

GLAND COCK.— A plug cock in which the plug is covered with a gland or small casting screwed down over the packing to make it steam and water tight.

GLOBE VALVE.— A valve with a spherical casing. An interior annular seating divides the chamber into two parts, it is therefore sometimes called a diaphragm valve. It is generally used as a stop or regulating valve.

GOVERNOR VALVE GEAR.— The valve gear or mechanism by which governors regulate the opening and closing of the induction valve in automatic expansion.

GRIDIRON VALVE.— A slide valve in which the ports are subdivided transversely by narrow bars corresponding to similar subdivisions in the cylinder ports, so as to give the necessary steam-way with a reduced travel of the valve. These valves may be double or treble ported.

GROUPED SAFETY VALVE.— A Cowburn, Dead-load Safety, or Dead-weight Safety Valve.

HEAD VALVE.— The uppermost or delivery valve of an air pump.

IGNITION VALVE.— The valve of a gas engine by which the charge is ignited or fired.

INDICATOR COCK.— The cock employed to make or break a communication between the piston of the indicator and the cylinder of the engine.

INJECTION COCK.— The cock through which supplies of water are admitted to the condensers of marine engines.

INJECTION VALVE.— An Injection Cock.

INLET VALVE.— A foot valve.

JOY'S GEAR.— A valve gear in which the valve rod is worked directly through a coupling rod or link from the connecting rod, and not by means of eccentrics. The necessary travel is obtained by utilising the up and down movement of the coupling link to move a disc block to which one end of the valve rod is fastened, which slides up and down in a slot link moving in a fixed centre and placed at an angle with the rod. The engine is reversed by altering the direction of the angle of the slot link about its fixed centre.

JUNCTION VALVE.— A two-way valve which unites two pipes.

KINGSTONE VALVE.— A wing valve used as a suction valve for a marine condenser, and as a blow-off for a marine boiler. It opens toward the sea, but is capable of closing itself in case of the breaking of the spindle.

LAP.— The amount by which a slide valve covers the steam port at the termination of the piston stroke. It indicates the amount of cut-off of steam in the cylinder. See Exhaust Lap and Outside Lap.

LAP CIRCLE.— The circle of a lap diagram, the radius of which represents the lap of the valve. If the laps are unequal, the diagram will have two lap circles.

LEAD OF A VALVE.— The amount a slide valve is opened at the termination of the piston stroke to admit steam for cushioning. It varies from 1=32-inch in low-speed, to ¼-inch in high-speed engines.

LIFT VALVE.— A disc valve fitting on an annular seating, and guided in its lift by three or more feathers which project into the body of the seating. It has a full water-way when the amount of lift equals one-fourth the diameter of the valve. See Mushroom Valve and Poppet Valve.

LOCK-UP SAFETY VALVE.— A safety valve the spring of which is enclosed in a padlocked casing.

MINUS LAP.— The internal or exhaust lead on a steam valve. It is the lead to exhaust, reducing the amount of cushioning, and is used with high-speed engines where smooth running is essential.

MITRE VALVE.— A part of the annular seating of a safety valve turned to an angle of 45° in section, upon which the valve itself rests.

MUSHROOM VALVE.— A lift valve formed in the shape of a mushroom.

MUSHROOM STRAINER.— A foot valve formed in the shape of a mushroom, and provided with a perforated strainer plate.

OPEN SAFETY VALVE.— A safety valve that has no lock-up

OUTSIDE LAP.— Lap given to a slide valve on the outer edges, as distinguished from exhaust lap. Its amount is a measure of the ratio of expansion of the steam, an early cut-off implying a high ratio of expansion.

PET COCK.— A small plug cock. One is always inserted in the end of a steam cylinder through which the water of condensation is allowed to escape when the engine is started, so as not to blow out the cylinder ends.

PISTON VALVE.— Any valve mounted on a piston, as one that opens and closes steam ports arranged diagonally around the seating.

PLUG.— The inner movable part of a cock, which upon being turned allows the fluid to pass through.

PLUG COCK.— A cock fitted with a central plug which when rotated presents either a solid surface, or a passage through its body to the flow of the liquid.

POPPET or PUPPET VALVE.— A lift valve.

POT-LID VALVE.— A hollow, cup-shaped lift valve.

POT VALVE.— A safety valve having the shape of an inverted pot. It is a lift valve with a conical pivot which drops loosely into a recess in the crown of the pot. The lift is held and controlled by guides cast on the top of the seating, and they are not liable to stick.

PRIMING VALVE.— A pet cock used for priming.

REDUCING VALVE.— A valve arrangement used for regulating the steam pressure between a boiler and its connections. The opening of the valve is controlled by a weighted lever.

REFLUX VALVE.— A flap valve used for the purpose of relieving the pressure of a head of water acting in a backward direction against a set of pumps; a check valve.

REGULATOR VALVE.— A valve of the conical, double-beat, or sliding types, employed to regulate the admission of steam to the cylinders of a locomotive.

RELIEF VALVE.— A cylinder escape valve.

RETAINING VALVE.— A valve inserted in the pipe of a deep-well pump in addition to the regular valves to prevent much of the water from running back between the strokes.

RETURN VALVE.— One that allows the return of a fluid to the source of supply.

REVERSING SHAFT.— See Weigh-shaft.

REVERSING VALVE.— Any valve of reversing action, as one employed to introduce the air and gas into one or the other chambers of a regenerative furnace, as they become alternately cooled and heated.

RING VALVE.— A lift valve in which a ring is substituted for the solid disc, so as to allow the fluid to pass through on both the outer and inner edges, thus reducing the amount of lift to one-half of that required by the use of a solid disc. Valves with two rings by which the amount of lift is still further reduced, are also used.

ROTATING VALVE.— A cylindrical valve constructed on the principle of the plug cock, and thus differing from the disc, lift, and slide valves.

ROUND BODY VALVE.— A pump valve with a cylindrical shaped body.

SAFETY VALVE.— The relief valve employed to prevent excessive and unsafe pressures in steam boilers. It is usually some form of a lift valve provided with suitable mechanism to give the valve a definite pressure. The resistance is either a lever with an adjustable weight, a spring the tension of which may be adjusted by a movable nut, or a dead weight.

SAND VALVE.— A valve employed to regulate the escape of sand from a sand box for sanding a track.

SCREW-DOWN VALVE.— A valve which is raised or depressed by means of a screw. A globe valve, or a sluice valve.

SEA COCK.— An injection cock inserted in the side of a steamship, and leading from the sea to the condenser. It is supplementary to the regular injection cock.

SEAT or SEATING.— The contacting surface upon which the moving part of a valve rests when it is closed. It requires to be a perfect fit.

SETTING OF VALVES.— A term specifically applied to the adjustment of engine-slide valves, an operation of great precision, and performed in various ways according to the nature of the link motion. See article LOCOMOTIVE, DESIGN AND CONSTRUCTION OF THE MODERN, in this encyclopedia.

SHELL.— The outer casing of a cock or valve.

SIDE-DISCHARGE VALVE.— See Discharge Valve.

SIDE-DISC VALVE. A disc-shaped plug valve which rests against one face of a seating only; it is therefore not so tight as a double disc valve.

SLIDE-VALVE.— The typical valve of a steam-chest, though used with other forms of motors. It works with a sliding motion as distinguished from the motion of rotating, or of lift valves. The term is specifically applied to the valves of steam and gas engines of the ordinary type, and not to Corliss, or to lift valves. See article LOCOMOTIVE, DESIGN AND CONSTRUCTION OF THE MODERN, in this encyclopedia.

SLUDGE COCK.— The cock at the bottom of a steam boiler through which the boiler is cleaned from sludge, by periodical washings with a strong current of water.

SNIFTING VALVE.— A relief valve which allows the escape of a fluid, or a gas, when a definite amount of pressure is attained. In condensing engines it allows the steam and air which mingle in the blowing-through process, to pass out of the cylinder. In some gas engines, it is employed to regulate the amount of the charge admitted to the combustion chamber.

SPINDLE VALVE.— A lift valve guided by an axial spindle or central stem.

SPIRAL WINGED VALVE.— A lift valve, the wings of which, instead of being placed at right angles to the seat, are arranged as sections of a spiral of very long pitch. By this arrangement, the valve is turned around a little on its seat at each lift, and its wear is rendered more uniform.

SPRING-BALANCE VALVE.— A safety valve which, instead of being weighted, is attached to a spring balance, the graduations of which indicate the pressure.

SPRING SAFETY VALVE.— A spring-balance valve.

SQUARE-BODY VALVE.— A pump valve having a rectangular casing.

STARTING VALVE.— The valve through which the steam from the boiler, or from the connecting pipes, is admitted to the cylinder of an engine. It may be any one of the following types: A sliding disc valve actuated by a lever; a lift or poppet globe valve lifted by a screw; or a plug valve turned by a wheel.

STEAM CHEST.— The rectangular case or box attached to the side of an engine cylinder, and containing the slide valve and a portion of the valve rod. See LOCOMOTIVE.

STEAM LAP.— The amount the faces of a slide valve are extended beyond the length required to cut-off live steam exactly at the termination of the piston stroke. Used in a contrary sense to exhaust lap.

STEAM VALVE.— Any form or type of valve by which a steam supply is regulated.

STOP COCK.— A globe valve or stop valve, as one attached to a steam boiler by means of which the steam is turned into, or shut off from, the pipe connecting the boiler with the engine cylinder.

STOP VALVE.—Any valve or stop cock used for regulating the flow of fluids.

STRAIGHT-WAY VALVE.— A valve in which the waterway passes straight through, without making a bend.

SUCTION VALVE.— Any valve operating by suction, as the lowermost valve in a lift pump. It is actuated by the pressure of the atmosphere beneath the valve acting against the vacuum above.

TEST COCKS.— See TRY COCKS.

THREE-WAY COCK.— A cock having three branches, by which the fluid from the inlet branch may be diverted into the other two at will.

THROTTLE VALVE.— A flat thin disc valve which lies diagonally across a round pipe, closing it partially or entirely. Used in dampers or flues, and in the smoke pipes of engines leading from boilers, to regulate the passage of smoke and steam.

TREBLE or TRIPLE VALVE BOX.— A pump valve casing provided with suction and delivery valves, and also an intermediate retaining valve to render the supply continuous; used on stationary or portable engines for pumping water to the boiler.

TRY COCKS.— Cocks inserted in the shell of a boiler at extreme high and low water marks. The upper one is the steam cock and the lower one the water cock. They are used for checking the water gauge in case it chokes up or ceases to act.

VALVE BOX.— The box or casing which encloses the valves, as of pumps. Also the steam chest which contains the slide valve of an engine.

VALVE BRIDLE.— See Bridle.

VALVE CASING.— The shell of a valve; a valve box.

VALVE CHAMBER.— A valve box. The term is usually applied, however, to a steam chest rather than to an ordinary valve box.

VALVE CIRCLE.— The circle on a valve diagram, the diameter of which is equal to one-half the travel of the valve. A valve diagram has two such circles.

VALVE COCK.— A cock which is operated by a lift, slide or other form of valve, instead of a plug. A globe valve is a valve cock.

VALVE DIAGRAM.— A diagram by which the position of the slide valve for any position of the piston, or the position of the piston for any position of the valve, may be determined graphically. Therefore, the relative positions of the valve and piston at the instants of opening, cut-off, cushioning, and release, may be accurately determined. There are various methods of constructing valve diagrams. The most familiar are the polar method, Reuleux's method, and Zeuner's method, the last named being the simplest.

VALVE FACE.— The face on or against which a slide valve moves, as distinguished from a valve seat.

VALVE GEAR.— The mechanical arrangements for actuating slide valves, both for single and reversing action, consisting of slot links, rods and expansion devices, automatic or otherwise.

VALVE PLATE.— See Cut-off Valve.

VALVE RING.— An equilibrium ring.

VALVE ROD or VALVE SPINDLE.— The rod which passes through the stuffing box in the steam chest, and is attached

to the slide valve and through which the valve is actuated from the eccentric.

VALVE-ROD GLAND.— The small casting which closes the stuffing box of the rod of a slide valve, and maintains the rod steam tight.

VALVE SECTOR.— A slot link or a quadrant. Also specifically applied to the vertical sliding link of an oscillating cylinder engine, by which the motion of the eccentric is communicated to the valve rod weight-shaft.

VALVE SPRING.— A spring used for pressing the packing or equilibrium rings of slide valves against their faces.

VALVE STEM.— A valve rod or spindle.

VALVE YOKE.— The bridle of a valve rod.

WASTE-WATER COCK.— A pet cock on a waste-water pipe.

WATER-WAY.— The opening or space in the bucket of a pump; the plug of a cock; or the area of a lift valve, for the passage of a fluid.

WEIGH-SHAFT or REVERSING SHAFT.— The rod or shaft which forms the centre of the lever that throws the slot link for the reversing motion of an engine, into the positions for forward or backward gear.

WHEEL VALVE.— A lift valve of globular form, the screw of which is lifted or depressed by means of a hand wheel above.

WING VALVE.— A lift or poppet valve, the lift of which is guided by three or four feathers, wings or ribs, cast on the under side of the valve and fitting into its cylindrical seat. It may be placed vertically as in the case of an ordinary safety valve, or horizontally or otherwise, if it is pressed against its seating by means of springs.

VALVERDE, vạl-vār'dā, or **FORT CRAIG** (N. Mex.), **Battle of.** Early in February 1862 Fort Craig, on the Rio Grande, was held by Col. E. R. S. Canby, United States army, with about 3,800 men, composed of detachments from three regiments of regular infantry, two of regular cavalry, two batteries of artillery officered and manned by regular cavalry, a company of Colorado volunteers, detachments from five regiments of New Mexico militia and some unorganized militia. The fort had been greatly strengthened by throwing up formidable earthworks. In July 1861 the Confederate government, attaching much importance to New Mexico, had ordered Gen. H. H. Sibley to Texas, to organize and lead an expedition for its conquest. By the middle of November 1861 he had organized a brigade of four Texas mounted regiments and a battery, with which he marched from San Antonio, reaching Fort Bliss 14 December. Early in January 1862 he began his march up the Rio Grande, with about 7,000 men; and 16 February his advance was within two miles of Fort Craig, where it was met by Canby's cavalry, upon which Sibley, satisfied from the information he had obtained that with his light field guns an attack on the fort would be futile, withdrew down the river, and on the 19th he crossed to the eastern side, hoping to draw Canby out and fight him on open ground. On the 20th Canby sent a force of cavalry and artillery across the river and made a demonstration on Sibley's camp, but withdrew when his artillery opened a heavy fire. Early on the 21st Sibley made a demonstration toward the fort, while his main body pushed northward and approached the river again at Valverde. Lieut.-Col. B. S. Roberts, with cavalry, infantry and artillery, was sent from the fort to oppose the column should it attempt to cross the river; and before this about 500 mounted militia had been sent to watch Sibley in his camp. When Roberts arrived at the ford, seven miles above Fort Craig, Sibley had already reached the river at the opposite side, and Roberts opened the battle by sending Maj. Thomas Duncan, with regular cavalry dismounted, across the river. Duncan drove the Confederates back, the Union batteries were established on the western bank, Roberts crossed his command to the eastern side and, after some sharp fighting, by 12 o'clock drove the Confederates from all the positions they had occupied. Meanwhile the Confederates had been reinforced from their camp, and at 12 o'clock Roberts was reinforced by Captain Selden's battalion of regulars and Col. Kit Carson's regiment of New Mexico volunteers. Another advance was made, the Confederate guns were silenced and McRae's and Hall's Union batteries were crossed and put in position. Canby came on the field at 2.45 P.M., bringing reinforcements from the fort, after the Confederates had been driven from all their positions to the shelter of a high ridge of sand, where, unseen, they reformed and prepared for a charge upon the two Union batteries. Sibley, who was sick, had turned the command over to Colonel Green of the Fifth Texas Cavalry. There was a lull in the fight, which was broken by a most impetuous assault. The Fourth Texas Cavalry made directly for Hall's battery, on the Union right, but met with such a severe fire of canister and musketry from the supporting cavalry and infantry that, when within 100 yards of the battery, it was repulsed with great loss, falling back in disorder. This was immediately followed by a charge upon McRae's battery by the greater part of Green's available command on foot and armed with shotguns, squirrel-rifles, revolvers, lances and knives. Canister and musketry made gaps in the ranks, but did not stop them, and the battery supports gave way after a close hand-to-hand fight. Captain McRae, Lieutenant Mishler and most of the gunners were shot down beside their guns, all the horses were killed and the guns were captured. A panic now ensued among the greater part of the New Mexico militia, but some of them, with the regulars and Colorado volunteers, were withdrawn in comparatively good order across the river, and Canby retreated to Fort Craig, unmolested by the Confederates. Sibley buried his dead, remained two days at Valverde and moved up the river to Albuquerque. The Union loss was 68 killed, 160 wounded and 35 captured; the Confederate loss, 36 killed, 150 wounded and one missing. Consult 'Official Records' (Vol. IX); The Century Company's 'Battles and Leaders of the Civil War' (Vol. II).

E. A. CARMAN.

VALVES (from Latin *valvæ*, folding doors), a mechanical appliance or device employed to control the flow of liquids, gases and loose material, such as sand and mud, through pipes, chutes or other forms of passages. They operate by the lifting and falling, sliding and swinging or rotating of lids, covers, balls or slides placed at the openings of or inserted in the pipe, tube or other form of passageway, as the case may be. They are usually made of metal, such as cast iron, steel, bronze and brass, often combined with leather, rubber or other flexible material, to ensure their tightness.

They are known and designated under a variety of trade and workshop names according to the purposes for which they are used, the particular shape or the peculiar motion of the valve, and according to the method of their operation, thus introducing such terms as globe valve, slide valve, ball valve, safety, etc., which defy classification. On the other hand, all forms of valves may be conveniently grouped

into several definite classes according to the motion of the valve relative to the valve seat and according to the manner in which that motion is produced.

Valves classified according to the motion of the valve relative to the valve seat are typified by (1) those which rotate in the opening; (2) those which lift and fall vertically from and to their seats; (3) those in which the flaps or lids are hinged to their seats and work with a swinging motion; and (4) those which open and close by sliding on and parallel to their seats. Valves classified according to the manner in which their motion is produced may be defined as (1) those operated by hand; (2) those operated by independent mechanism; (3) those operated by mechanism actuated by the machines the operation of which is controlled by the valves; and (4) those operated by the motion of the liquid, gas or other fluid material, the flow of which is controlled by the valves.

It is quite clear that the characteristics of these primary classifications may be combined in any one valve, as in the case of a slide valve which may be operated in various ways: (1) by hand, as in the case of the ordinary screw gate valve; (2) by independent mechanism, as in the case of the hydraulic gate valve; and (3) by mechanism connected with the operating medium, as in the case of the slide valve of a locomotive.

Probably the most ancient form of valves are the leather flap valve, as shown at A, Fig. 1, and disc valve, shown at B, Fig. 1, commonly used in small pumps at the present time, and from which the present check and foot valve respectively are devised. The two most common types of valves in use to-day are the "gate or straightway" and the "globe," the former so called because of the motion of the mechanism acting as a gate in opening and closing, and permitting when open a clear and

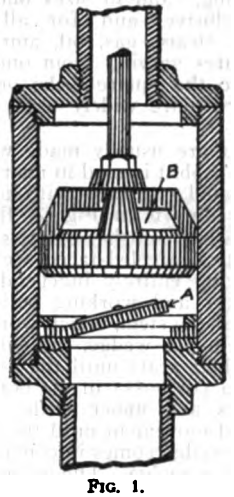
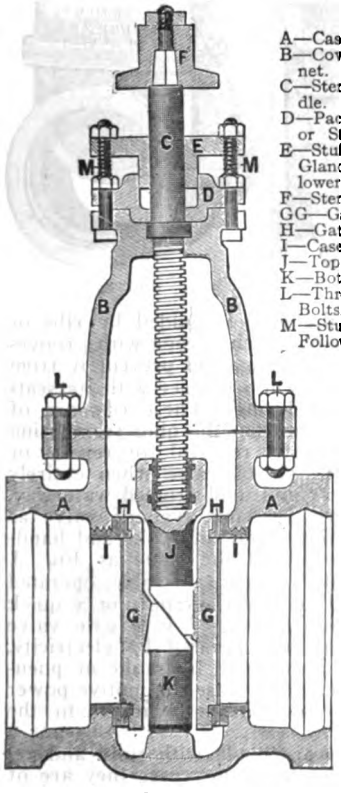


FIG. 1.



A—Case.
B—Cover or Bonnet.
C—Stem or Spindle.
D—Packing Plate or Stuffing Box.
E—Stuffing Box. Gland or Follower.
F—Stem Nut.
GG—Gates.
H—Gate Rings.
I—Case Rings.
J—Top Wedge.
K—Bottom Wedge.
L—Throat Flange Bolts.
M—Stuffing Box or Follower Bolts.

FIG. 2.

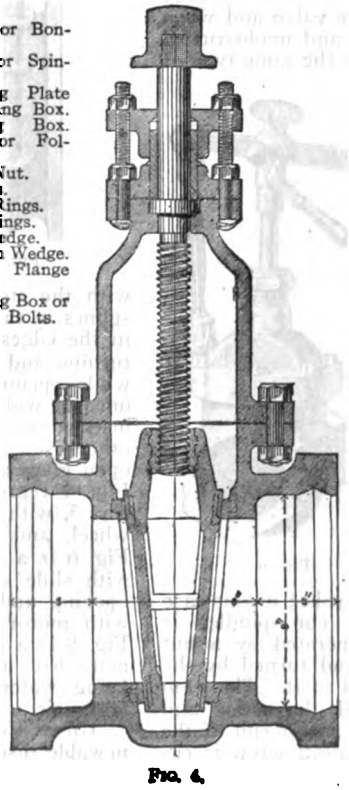


FIG. 4.

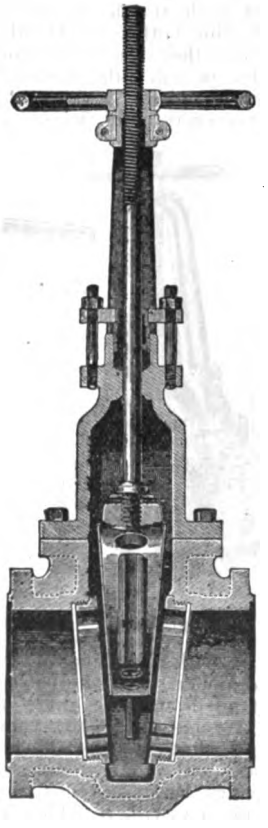


FIG. 5.

unobstructed passageway for the fluid to pass through, the latter so called from the globular form of its casings. The gate valve is made in two types, "parallel seated" and "beveled seated," or "plug," and in sizes one-fourth to 96 inches, inclusive, and for all purposes, namely, water, steam, gas, oil, ammonia, etc., and for pressures varying from one pound to 5,000 pounds to the square inch; on these accounts they are more widely used than globe valves.

Gate Valves are usually made with bronze seats, although babbitt is used in many instances. The parallel seated gate valve with inside screw, wheel type, is shown in Fig. 2, the internal mechanism of which consists of the stem C, two gates G and two beveled-faced wedges, J K, the wedges being entirely independent of the gates (or discs) and working between them. By the action of the stem, which works through the nut in the upper wedge, the gates descend parallel with their seats until the lower wedge strikes the stop (or boss) in the bottom of the case, the gates and upper wedge continuing their downward movement until the face of the bevel of upper wedge comes in contact with face of bevel of lower wedge. The gates being then down opposite port, or valve opening, the face of the upper wedge moves across the face of the lower wedge, bringing pressure to bear on the backs of both gates, from central bearings, thus forcing them apart and squarely against their seats. In opening valve the first turn of the stem releases the upper wedge from contact with the lower wedge, thereby instantly releasing both gates (or discs) from their seats before they commence to rise. This style of valve is called the double-gate valve and when entirely opened gives a clear and unobstructed passageway. Fig. 3 represents the same type of

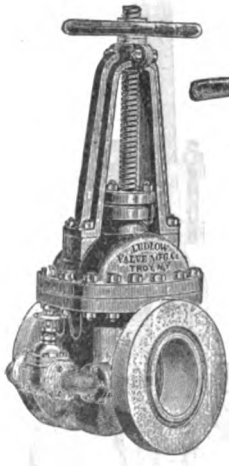


FIG. 3.

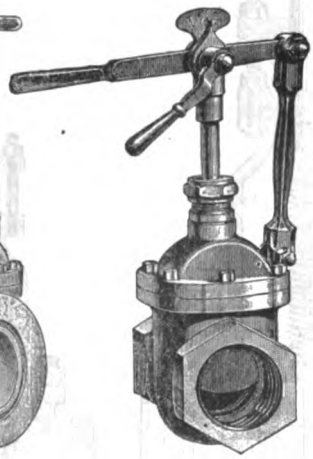


FIG. 6.

valve with outside screw and yoke; in this case the upper end of the stem (or spindle) is threaded and the stem is operated by a nut held vertically in the yoke and turned by the hand-wheel, which is fastened to it. The stem rises without revolving, and the gates and wedges, being fastened to the lower end of the stem, rise with it. The operating screw is entirely outside of the valve body, where it can be inspected and oiled, and the rising stem forms the best kind of an indicator. Fig. 4 is a bevel-seated gate valve, with inside screw of the double-faced solid wedge gate or plug type, in one piece, made wedge-shaped or tapering, braced or ribbed, and by the action of the stem working through the nut in the top closes vertically between two inclined seats or surfaces in the body. To ensure perfect alignment

FIG. 7.

FIG. 8.

with the stem the plug is guided by ribs or splines in the body, which engage with grooves in the edges of the plug, and prevent it from turning and coming into contact with its seats while opening or closing. These ribs are of unequal width, to prevent the plug from being inserted wrongly after removal for repairs or otherwise. This style of valve when entirely open gives a clear and unobstructed waterway. Fig. 4 represents the same type of valve as Fig. 5, with outside screw and yoke and hand-wheel, and is operated the same as Fig. 3. Fig. 6 is a parallel-seated gate valve, operated with slide stem and lever, permitting a quick opening and closing. Fig. 7 is a gate valve with motor attached, operated by electricity. Fig. 8 is a gate valve with hydraulic or pneumatic lift; in the former case the motive power being water to operate the cylinder, in the latter air.

Globe Valves are made with solid and renewable discs; in the former case they are of brass and in the latter of soft metal, asbestos

or packing of some kind. Fig. 9 represents the most common type of globe valve. It is provided with a vulcanized asbestos disc ring. The ring is composed of the fibre of asbestos, to which is added a waterproof vulcanizing material, making a very durable packing, which will

FIG. 9.

not crack or flake off. It is held centrally on its seat by guides cast on the body of the valve. It is also secured to the spindle without the use of nuts, screws, pins or wires. The vulcanized asbestos ring is forced into a brass holder and the metal is spun or turned over the

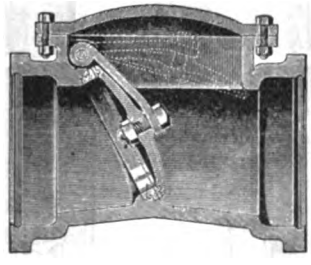


FIG. 10.

edges of the ring, so that it cannot drop out. This valve has a raised round seat, upon which scale, grit or sediment is less likely to lodge than on the broad flat seats sometimes used. On account of the construction of the valve seat, as will be noted in the cut, globe valves

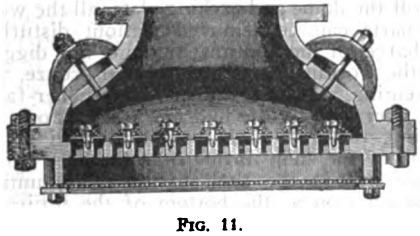


FIG. 11.

do not permit of a clear and unobstructed passageway. Fig. 10 shows the check stop, or as it is sometimes called back-pressure valve. This valve is used in a horizontal pipe, to prevent the backward movement of a fluid. After the fluid has raised and passed the gate, the pressure being removed from the face of the gate it closes thereby checking or stopping the fluid from flowing in the reverse direction. Fig. 11 represents the foot valve, its use and operation being similar to the check valve. It is used, however, in a vertical pipe and at the end of the suction pipe of a pump.

Air Valves are made for two common purposes, namely: To be placed on mains at high points where air accumulates and obstructs the

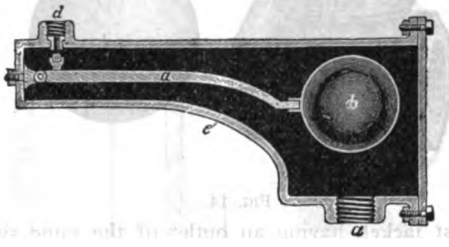


FIG. 12.

flow of water and for use on pipe lines to permit air to enter when water is drawn off, and to allow air to escape when pipes are being refilled. The former, the lever-and-float air valves, are shown in Fig. 12. When air takes the place of water about the float in the valve chamber, the float which is attached to the bronze lever drops, thus opening the small valve and allowing the air to escape. As the water returns it lifts the float, thereby closing the valve. Fig. 13 represents the poppet air valve; when filling a line of pipe the gate remains open until the water reaches and lifts the copper float, thereby closing the gate, which remains closed while the pressure is on. Fig. 14 is an external view of a common lever safety valve. The valve consists of a gate with a

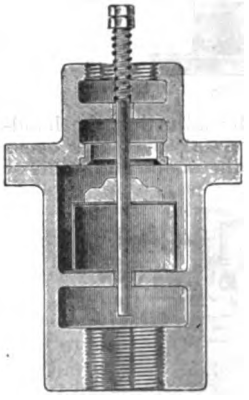


FIG. 13.

FIG. 15.

conical edge, resting on a conical seat, and is held to its seat by the pressure of a weight acting on a lever as shown. The spring safety valve is shown in Fig. 15, the spring taking the place of the lever and weight; this style of safety valve is known as the pop safety. Fig. 16 represents a relief valve, similar in construction to the pop safety valve, but instead of being used for steam is intended for use on water mains, for the purpose of relieving the pipes of water hammer, to which they may be

subjected. The gate as in the pop safety valve, is held to its seat by the pressure of a spring, which is protected, as shown in the cut, by a

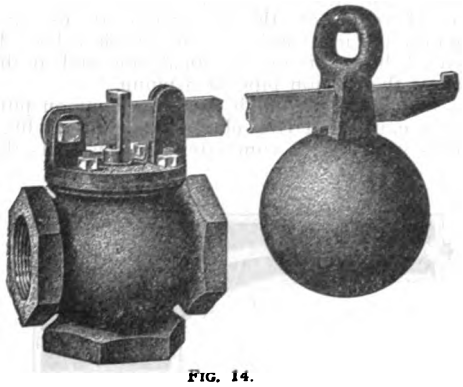


FIG. 14.

cast jacket, having an outlet of the same size as the inlet. The operation of the valve is as follows: When the valve is set at the pressure

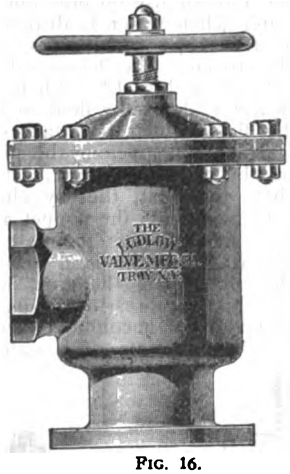


FIG. 16.

desired, which is done by adjusting the hand-wheel, any excess of pressure over this opens the valve, thus relieving the mains and joints of

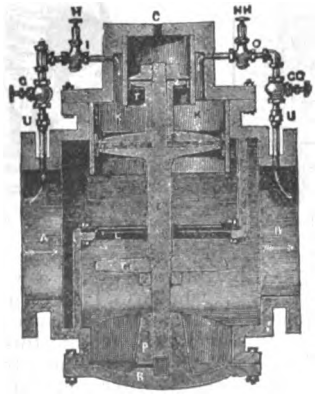


FIG. 17.

any extra strain, and doing away with the breaking of pipes or blowing out of joints. The regulating valve, as shown in Fig. 17, is used to control or reduce pressure in street mains and pipe lines or to regulate the flow of water between reservoirs located at different levels. This valve can be placed in any position. Owing to the manner of packing, the friction is but trifling, as can be readily understood by examining the cut.

Valves also form the principal part of hydrants or fire plugs, and are of two distinct types: slide gate and compression, according to the valve motion.

Gate Hydrants.— Fig. 18 represents the gate hydrant, which is absolutely non-freezing, owing to the fact that the drip is positive and being in the bottom of the hydrant it drains it completely, no water being left in the barrel when the hydrant is closed, to freeze; therefore, no outer jacket, or frost case, is necessary.

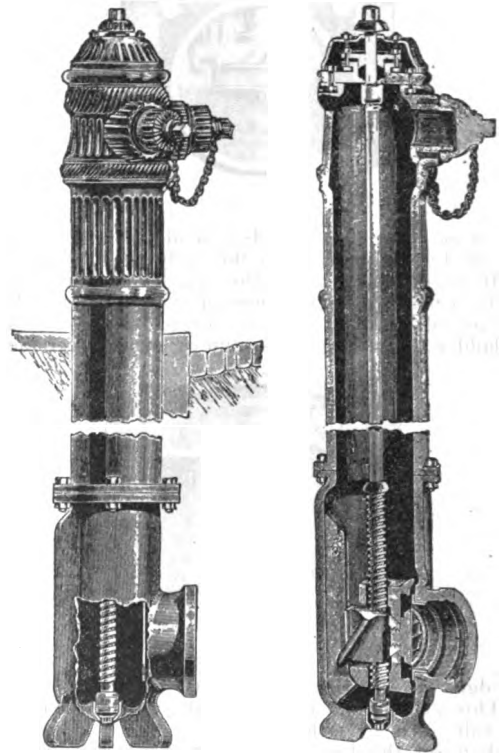


FIG. 18.

The working parts are so arranged, that by taking off the dome and packing plate, all the working parts can be removed without disturbing the barrel of the hydrant, or doing any digging. All the working parts are of solid bronze, thus preventing rust, and the gate is rubber-faced. The operation of the hydrant is as follows: In closing, the gate is moved downward by the action of the stem through the threaded bronze wedge nut in the back of the gate, until it strikes a stop at the bottom of the projection in the back of the hydrant, when by the action of the bronze wedge nut, moving along the incline on the back of the gate, it is forced squarely against its seat without any grinding movement on either the rubber gasket, with which the gate is faced, or on the bronze seat ring against which it closes, the projection at

the top and bottom of the gate keeping the rubber gasket away from the seat ring until it is forcerd squarely against it by the action of the wedge nut. The final turn of the stem, after the gate is closed and wedged, opens the drip valve. In opening the hydrant, the first turn of the stem closes the drip valve, after which the bronze wedge nut in back of gate is loosened, thus relieving the gate from its seat.

Compression Hydrants are of three kinds: Those with the gate opening against the pressure; with the gate opening with the pressure;

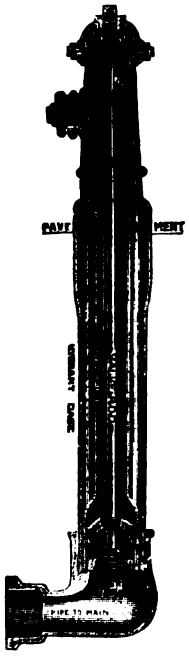


FIG. 19.

and the double or balance gate. The compression hydrant with gate opening against the pressure is shown in Fig. 19. It will be noticed in this hydrant that a frost case is necessary, and also that the drip being above the hydrant bottom it drains the barrel only, the water remaining in the bottom when the gate is closed. The thread for opening and closing the gate is in the top of the hydrant; the gate is moved downward by turning the nut or sleeve at the top of the hydrant, through which the threaded stem works. The drip is closed during the opening of the hydrant and opened during its closing, being completely opened or closed when the gate is closed or open. This hydrant's working parts are bronze mounted, and it has either a leather or rubber faced gate. Fig. 20 represents the compression hydrant with a double balanced, or compensating rubber valve. It is constructed with bronze working parts and like the gate hydrant has a positive drip directly in the bottom of the hydrant, permitting no water to remain in the hydrant to freeze. All its working parts can be removed without digging, and also like the gate hydrant the so-called frost case is unnecessary. This hydrant is particularly adapted for high pressures, on account of the ease with which it can be operated, and as the main valve closes both with and against the pressure no water ram or hammer can take place. In operation, the upper valve opens with the pressure and the

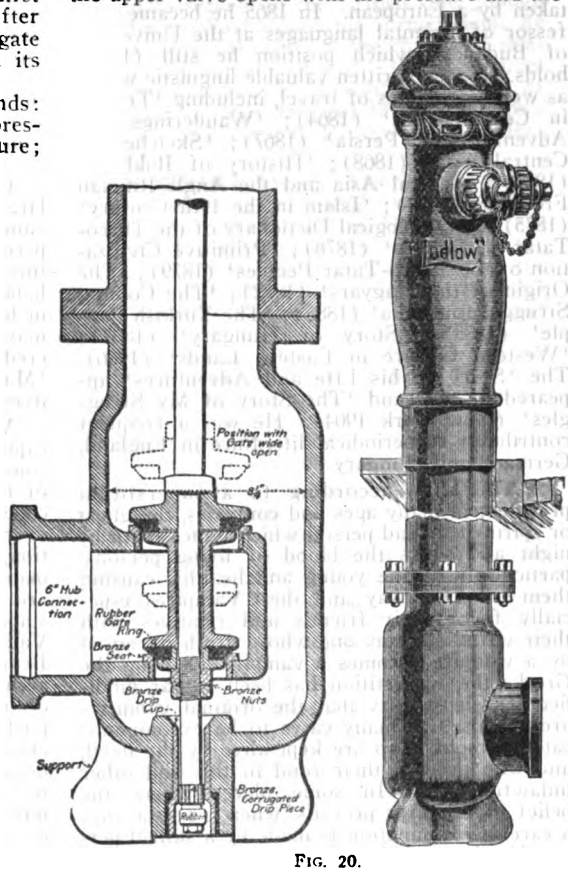


FIG. 20.

lower valve against the pressure; in closing, the conditions are reversed. The valve or double header is thus in equilibrium and can be opened or closed without effort. As the hydrant is opened, the drip or waste outlet is at once closed, the drip valve being drawn up into the bronze drip cylinder. In closing the hydrant, the drip valve is pushed out of the bronze cylinder in the flared lower end of the same. The water in the standpipe then passes out through the corrugations of the bronze guide on the lower end of stem or valve rod. Nozzles, on all hydrants, vary in number and size, according to the purposes for which they are intended to be used. See VALVE TERMS; and for other forms of valves, see PNEUMATICS; PUMP; STEAM-HAMMER and STEAM-ENGINE. For valves of circulation, see HEART.

JAMES H. CALDWELL,
President, The Ludlow Valve Manufacturing Company.

VAMBÉRY, väm'bā-rē, **Arminius,** Hungarian traveler and scholar: b. Szerdahely, 19 March 1832; d. 1913. He studied at Pressburg, Vienna and Budapest, and then went to Con-

stantinople, where he lived by teaching French. In 1858 he published a German-Turkish dictionary, and in 1861–64, disguised as a dervish, made a journey of exploration through Persia into Turkestan, and visited Khiva, Bokhara and Samarcand, the first tour of the kind undertaken by a European. In 1865 he became professor of Oriental languages at the University of Budapest, which position he still (1907) holds. He has written valuable linguistic works as well as volumes of travel, including 'Travels in Central Asia' (1864); 'Wanderings and Adventures in Persia' (1867); 'Sketches of Central Asia' (1868); 'History of Bokhara' (1873); 'Central Asia and the Anglo-Russian Frontier' (1874); 'Islam in the 19th Century' (1875); 'Etymological Dictionary of the Turco-Tatar Languages' (1878); 'Primitive Civilization of the Turco-Tatar Peoples' (1879); 'The Origin of the Magyars' (1822); 'The Coming Struggle for India' (1885); 'The Turkish People' (1885); 'Story of Hungary' (1887); 'Western Culture in Eastern Lands' (1906). The 'Story of his Life and Adventures' appeared in 1888 and 'The Story of My Struggles' (New York 1904). He was a frequent contributor to periodical literature in England, Germany and Hungary.

VAMPIRE, according to a superstition prevalent in many ages and countries, the ghost or spirit of a dead person which issues forth by night and sucks the blood of living persons, particularly of the young and healthy, causing them to pine away and die. Vampires especially favor their friends and relatives with their visits, and any one whose death is caused by a vampire becomes a vampire. Among the Greeks the superstition has been so far modified by Christianity that the original vampires are supposed in many cases to be excommunicated persons, who are kept alive by the devil, and who procure their food in this and other unlawful ways. In some places where the belief in vampires prevails, when a person dies a careful examination is made by a skilled person lest he should have been killed by a vampire and so be liable to become one; if this is suspected, the body may be pierced with a stake cut from a green tree, the head cut off and the heart burned. This is also the process for destroying the vampire spirit in a corpse believed to be already a vampire. The belief has been treated by Philostratus and Phlegon of Tralles; has served a literary purpose in Goethe's 'Braut von Korinth' and the operas of Palma, Hart and von Lindpainter. While seemingly a primitive and savage superstition, it has survived in many forms. Consult Ralton, 'Russian Folk-tales'; Hert, 'Der Werwolf' (1862); Stoker, B., 'Dracula' (1899). See WERWOLF.

VAMPIRE-BAT, a genus of blood-sucking bats, of the carnivorous family *Phyllostomidæ,* distinguished by leaf-like nasal appendages, three joints to the middle finger and often well-developed median incisors. They inhabit South and Central America. Owing to the inaccuracy of travelers' accounts, which have ascribed blood-sucking habits to a large fruit-eating species, the effect of their attacks has been much exaggerated. The true sanguinivorous vampire bat is now known to be a small species not more than three inches in length and distinguished by its trenchant and enlarged upper incisor and canine teeth, capable of slicing the skin like a razor; the very much reduced molar teeth; and the extremely narrow lumen of the alimentary canal and especially of the æsophagus, all peculiarities which adapt it to an exclusive diet of blood. This is *Desmodus rufus,* and a second closely related bat is *Diphylla ecaudata.* The former is abundant in wooded regions from southern Mexico to Chile; the latter occurs in Brazil. Bates and Wallace were themselves bitten by bats during their famous Amazon journey, and other travelers have confirmed the evidence of these naturalists.

Owing to the error above referred to the large bat mentioned is still often called the vampire, and as *Vampyrus* the name has become permanently fixed to it in scientific nomenclature. The common species (*V. spectrum*) inhabits Brazil, and is about six or seven inches in length; but the spread of the wing-membrane may measure over two feet. The body is covered with a light brown hair. Consult Beddard, 'Mammals' (New York 1900) and the narratives of the travelers mentioned.

VAN, van, Turkey in Asia, (1) A town, the capital of a vilayet of the same name, 145 miles southeast of Erzerum, close to the east shore of Lake Van. It stands on an extensive plain covered with beautiful gardens and orchards; overlooking it is the citadel, in a ruinous condition, crowning a lofty calcareous height. Roman Catholic and American Protestant missions are maintained here. Cotton cloth is the only staple article, both of manufacture and export. Van succeeded the Ivan of Cedrenus and the Byana of Ptolemy, and the vicinity is rich in archæological remains. Armenian massacres occurred here in 1895 and 1896. It was occupied by the Russians in 1915. Pop. of the town, about 35,000, Mohammedans slightly preponderating over Armenian Christians. Pop. of the vilayet (1915) 379,800; area, 15,170 square miles. Petroleum is found, and there are undeveloped mineral resources believed to be considerable. (2) Lake Van, situated at a height of about 5,300 feet above sea-level, is of irregular shape, contains many islands and has an area variously estimated at from 1,200 to 1,500 square miles. Its water is salt, but becomes brackish near the mouths of the streams. It has no visible outlet. A small herring-like fish is caught in its waters, salted and exported to Asia Minor.

VAN AMRINGE, ăm'rĭnj, **John Howard,** educator: b. Philadelphia, 3 April 1835; d. 1915. He was graduated from Columbia University in 1860, and received from Columbia and other colleges the honorary degrees of Ph.D., L.H.D. and LL.D. He was actively connected with Columbia University as tutor, adjunct professor and full professor of mathematics, being made emeritus professor in 1910. Was dean of the School of Arts 1894–96, dean of Columbia College 1896–1910, and president pro tempore 1899, of Columbia University, also first president of the American Mathematical Society. He wrote a history of Columbia College and University, and many articles and pamphlets on life insurance, vital statistics, etc.

VAN BOKKELEN, bŏk-kĕ'lĕn, **Libertus,** American educator and clergyman: b. New York City, 22 July 1815; d. Buffalo, 1 Nov. 1889.

Although most of his life was spent as rector of various Protestant Episcopal churches in the States of Maryland and New York, and although during the Civil War period he was widely known as an Abolitionist, his chief claim to fame is doubtless his notable career as an educator. In 1845 at the suggestion of Bishop Whittingham of Maryland he established a church military school, known as Saint Timothy's Hall, at Catonsville, Md. This was the first school of its kind in the United States, and it soon became widely known throughout the South. His national fame, however, rests on the fact that in 1864 he was appointed by Governor Bradford as the first superintendent of public education for the State of Maryland; and in this capacity he elaborated a comprehensive educational plan which was incorporated in a bill entitled "A Uniform System of Public Instruction for the State of Maryland." Dr. Van Bokkelen's administration of his high office was so successful that Franklin and Marshall College, Lancaster, Pa., in 1865 conferred on him the degree of LL.D. When Maryland adopted a new constitution in 1867 the office which he held was abolished, and he, therefore, returned once more to private life. On the day after his death the Buffalo *Express* paid him the following glowing tribute: "Dr. Van Bokkelen was indeed a remarkable man. He was a scholar who had become an authority on educational questions, a patriot and a philanthropist who dared to be an Abolitionist in a southern community, an able business man, and, withal, a devout and earnest pastor. To few men has it been granted to do so much good in a lifetime, and none can leave a fairer fame as a legacy to their loved children." A fuller account of his life may be found in George C. Keidel's 'Catonsville Biographies' (1915).

VAN BRAAM, Jacob. A Dutch soldier of fortune: b. Bergen-op-zoom, in the Netherlands, 1 April 1727. He entered the British naval service and acted as lieutenant with Lawrence Washington under Admiral Vernon, in the expedition to Carthagena. Then, accompanying him to Mount Vernon, he became the military instructor of George Washington, giving him much instruction as to fencing, flags, fortification and the armies of Europe. He accompanied Washington into the Ohio country in October 1753 and acted as translator of the French missives. On account of his alleged wrong rendering of one word, he received more blame than praise for his services, while jealous rivals and enemies made it the occasion for abusive criticism and malignant attack upon Washington himself. The voluminous controversy, which arose in the Virginia colonial legislature over Van Braam's asserted mistranslation, could hardly have arisen in New York, where the Dutch language was generally spoken, and the Netherlanders' association of ideas with the use of the word "assassin," which was not then in the Dutch language, but common in French and English, was better understood. The ordinary meaning of this word "assassin," as used in military parlance at this time, was not that of a dastardly or prowling murderer, but rather that of a soldier who attacks suddenly without warning; and this seems to have been the method of the impetous, young George Washington, in July 1753, when he rushed upon the French party, during which Jumonville was killed. In view of the whole situation — wind, rain, night, a flickering candle for light and a desire to be fair to both parties — the Dutchman most probably did the best he could and is scarcely to be blamed. During the Revolution, Van Braam served on the British side, though in a letter to Washington, his former pupil, he expressed personal regret at the change of relations and the fortune of war. His subsequent history is not known. Consult the lives of Washington by Marshall and Irving; Winson's 'Narrative and Critical History of America' (Vol. V).

VAN BRUNT, Henry, American architect: b. Boston, Mass., 5 Sept. 1832; d. there, March 1903. He was graduated from Harvard in 1854 and studied architecture. He served in the Union army on staff duty during a part of the Civil War period and subsequently practised his profession in Boston and Kansas City, Mo., and was the designer of many buildings of importance, chief among which is Memorial Hall at Harvard, a work performed with W. R. Ware. Among other buildings designed by him are the First Church, Boston, and the Public Library, Cambridge. He published 'Greek Lines and Other Architectural Essays' (1893).

VAN BUREN, văn bū'rĕn, **James Heartt,** American Protestant Episcopal bishop: b. Watertown, N. Y., 7 July 1850; d. 9 July 1917. He was graduated from Yale in 1873 and from Berkeley Divinity School, Middletown, Conn., in 1876, took orders in the Episcopal Church in the year last named and for more than 10 years was rector of Saint Stephen's Church, Lynn, Mass. In June 1902 he was consecrated bishop of Porto Rico.

VAN BUREN, Martin, eighth President of the United States: b. Kinderhook, N. Y., 5 Dec. 1782; d. there, 24 July 1862. His father, Abraham Van Buren, was of Dutch descent, a farmer and a tavern-keeper. He attented the village school, studied at Kinderhook Academy and in 1796, when 14 years of age, entered the law office of Francis Sylvester, where he read law and other subjects. In 1802 he entered the law office of William P. Van Ness of New York, an influential man and a close friend and defender of Aaron Burr. The latter paid considerable attention to young Van Buren. In 1803 he was admitted to the bar, returned to Kinderhook and practised his profession with great success. He was married in 1807 to Hannah Hoes, but the latter died in 1819. From 1808 to 1813 he was surrogate of Columbia County. He was in the State senate 1812 to 1820, and in February 1815 was made attorney-general, holding this office till 1819. In 1816 he removed to Albany and entered into a partnership with Benjamin F. Butler. He was elected United States senator in 1821 and re-elected in 1827, but resigned his seat in 1828 on his election to the governorship of New York. While holding the offices mentioned Van Buren became interested in politics. His father was a Jeffersonian-Republican, and Van Buren followed him politically. The State politics of New York were factional and complex in this period. It was out of this situation that the principles involved in the spoils system were developed. It was a thoroughly established system when Van Buren was made a member of the "Albany Regency,"

and he had in his own person experienced its operation, both to his advantage and disadvantage. The "Albany Regency" was a group of men organized to control the politics of New York and was sponsor for the spoils system in local, State and national affairs. While United States senator his political views became more and more fixed and precise. In general he was a strict constructionist, a States Rights man, and against the United States Bank. He was closely associated with Senator Benton of Missouri and Andrew Jackson, and thus laid the foundations of a life-long intimacy with these men. He was opposed to the principle of internal improvements at national expense though he was at first willing to vote for such improvements. He voted for the tariff of 1824 and 1828, but later was in favor of a tariff for revenue only. As chairman of the judiciary committee he endeavored to enlarge the influence of the Federal judiciary. As governor of New York he urged, in his first message, a Safety-Fund banking system, a plan whereby banks mutually insured each other's soundness. He resigned the office in March 1829 in order to become Secretary of State in Jackson's Cabinet. He used his influence to bring the followers of Crawford and Jackson together in preparation for the campaign of 1828, and did much to make Jackson's election possible. Van Buren was responsible, more than any other man, for the political creed of Jackson's administration. He resigned in 1831, because he felt that the public measures of the administration would be attributed to his intrigue, and thus made to injure the President. Van Buren has been accused of being primarily and chiefly responsible for the "Spoils system" which flourished under Jackson. While he did not oppose the system, the main responsibility cannot be placed on Van Buren. His most important work as Secretary of State was the opening up of trade in American vessels between the United States and the British West Indian colonies. The restrictions placed by Great Britain were removed and a source of international irritation disposed of. In June 1831 Van Buren was appointed Minister to England and spent some months abroad. In January 1832, however, the Senate rejected his appointment. Before his return to New York 5 July 1832 he had been nominated for the vice-presidency, and was elected in November. While he held this office he was the chief adviser of the President. He, however, disapproved the removal of the deposits. The Democratic-Republican Convention, which met at Baltimore 20 May 1835, was anxious to find a man to preserve the unity of the party and one who would carry on the principles of Jackson's administration. Van Buren received the unanimous vote of the convention. His platform declared that Congress did not have the power to distribute the surplus revenue without a constitutional amendment. He was opposed to the distribution of the proceeds of the sale of public lands among the States; to internal improvements at national expense; to a recharter of the United States Bank and to the abolition of slavery in the District of Columbia. He was elected to the presidency by a combination of the Middle States and New England against the West, which voted for Harrison, with the South divided. The electoral vote was 170 for Van Buren and 73 for Harrison. His Cabinet, with a single exception, was the same as Jackson's: John Forsyth of Georgia, Secretary of State; Levi Woodbury of New Hampshire, Secretary of the Treasury; Mahlon Dickerson of New Jersey, Secretary of the Navy; Amos Kendall, Postmaster-General, and Joel R. Poinsett, Secretary of War. In his inaugural address he stated his policy would be "A strict adherence to the letter and spirit of the Constitution." Van Buren inherited the financial troubles of Jackson's administration. He was not responsible for the Panic of 1837, and on the other hand did much to repair its damage. He called an extra session of Congress 15 May to meet the first Monday of September. His message to Congress was an important state paper. He declared that the law provided that the Secretary of the Treasury must deposit public moneys only in banks that paid their notes in specie; that, therefore, some agency must be provided for the custody of public moneys. He opposed the re-establishment of a national bank, because it was wrong in principle and the popular will had twice been expressed in opposition to it. He urged what was called the independent treasury system. The collection, safekeeping, transfer and disbursement of public moneys should, Van Buren said, be managed by public officers. His suggestion was not finally incorporated into law until 4 July 1840 and the act was repealed in 1842, but was again re-enacted in 1846 and this principle became a cardinal feature of American finance. This was the most important State act of Van Buren, and showed courage, firmness and the qualities of a statesman. Two other measures advocated by Van Buren and passed, were the issuance of $10,000,000 in treasury notes and the postponement of the distribution of the surplus among the States. Another question that arose in Van Buren's administration was the reorganization of the Texan Republic and its annexation to the United States. Van Buren was against both of these propositions, but the matter did not become a pressing one while he remained in office. Van Buren was a candidate for re-election in 1840 and the unanimous choice of the convention. He was opposed by the Whig candidate, Harrison, and was defeated by an electoral vote of 234 for Harrison to 60. He was charged with being a "Northern man with Southern principles." As ex-President he was active in expressing his political views. In 1843 he declared for a tariff for revenue only. He was a candidate for President in the election of 1844. The great question was the annexation of Texas, desired especially by the southern representatives to the convention. Van Buren's nomination seemed assured two months before the convention met, but now it was certain that his nomination depended on his surrendering his views on this question. He courageously set forth the reasons in his famous letter of 27 April. The nomination went to Polk, although on the first ballot Van Buren received 146 votes, or 13 more than a majority. The rule, however, required a two-thirds vote. In 1848 he was the Presidential candidate of the Free Soil Party but the Whig candidate, Taylor, was elected President. This ended his political career. After the election he spent

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two years in Europe, and on his return in 1855, he lived quietly at his old home in Kinderhook. The character of Van Buren has been a matter of some controversy. He has been called the first politician-president. He was brought up in an era of politicians and was made President by such men. His early political associates were men from this class, so that it is not strange that he did not measure up to the highest standard of statesmanship. However, he was not entirely lacking in real ability and statesmanship. He was known as a polite, affable, good-natured, mild, courteous and dignified gentleman. He was also known as a shrewd, practical, skilful politician, and was accused of being more anxious about the means than the end. He was the "Little Magician" in his ability to bring things to pass politically, but, except occasionally, his action seems not to have been determined by great moral forces. On the other hand he, on several important occasions, took the unpopular side of questions when he knew that such a course would be likely to have a very bad effect on his political career. His action on the Texas question in 1844 is a notable example and proved that he had moral courage. Calhoun was certainly wrong in asserting that he was only a practical politician with whom "justice, right, patriotism, etc., were mere vague phrases." He loved the Union, was anxious that money should not be taken from the people without exceedingly good reasons, and had a dislike for slavery and its extension. He at least showed great statesmanship during the panic of 1837 and is responsible for one of the most important and fundamental fiscal policies of the United States.

Bibliography.—There are numerous lives of Van Buren. Consult Bancroft, George, 'Martin Van Buren' (1889); Shepard, Edward M., 'Martin Van Buren' (Boston 1899); American Statesman Series, the best biography but very favorable. Contemporary campaign biographies are by W. H. Holland (Hartford 1835) and by David Crockett (Philadelphia 1836). Consult also a biography by William L. Mackenzie (Boston 1846), unfavorable; Orth, S. P., 'Five American Politicians' (1906); West, E. H., 'Calendar of the Papers of Martin Van Buren' (1911); Richardson, J. D., 'Messages and Papers of the Presidents' (Vol. III, 1896).

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VAN BUREN, William Holme, American surgeon: b. Philadelphia, Pa., 5 April 1819; d. New York City, 25 March 1883. He was educated at Yale and studied medicine in the University of Pennsylvania and in the hospitals of Paris, receiving his degree from the university (1840) and being appointed at the same time assistant surgeon in the United States army. He resigned in 1845 to assist his father-in-law in his surgical clinics in the University of the City of New York; was professor of anatomy there (1852-66) and was surgeon of Bellevue Hospital from 1866 until the time of his death. He was the author of several standard works.

VAN BUREN, Ark., city, county-seat of Crawford County, on the Arkansas River and on the Saint Louis, Iron Mountain and Southern and the Saint Louis and San Francisco railroads, about seven miles north of Fort Smith. It is in an agricultural region and has considerable lumber interests. The chief industries are zinc smelting, railway repair shops, car factory, lumber products, canned fruits, cotton products, ice, cigars, wagons and agricultural implements. There are one high school and elementary schools, good banking facilities and a daily and weekly newspaper. Natural gas is found in the vicinity. Pop. 3,878.

VAN BUREN, Me., town in Aroostook County, on the Saint John River and on the Canadian Pacific and the Bangor and Aroostook railroads. It is in the northeastern part of the State, on the New Brunswick boundary. Van Buren was incorporated in 1881 and is an important distributing point for many of the lumber camps. It is connected by stage lines with Fort Kent, Fort Fairfield and other places. The educational institutions are Saint Mary's College, public and parish schools and Good Shepherd Academy. Pop. (1910) 3,065.

VAN CORTLANDT, kôrt'lănt, **Jacobus,** American merchant: b. New York City, 1658; d. 1739. He served as mayor of New York in 1719 and after his death his estate was purchased for Van Cortland Park. The old manor house was converted into a museum.

VAN CORTLANDT, Philip, American soldier and legislator: b. Cortlandt Manor, Westchester County, N. Y., 1 Sept. 1749; d. there, 5 Nov. 1831. Graduated from King's College (now Columbia University) in 1758, he began work as a surveyor, but at the outset of the Revolution received the commission of lieutenant-colonel, commanding the 4th battalion of New York infantry. In 1776 he was made colonel of the 2d New York regiment. He fought, 7 Oct. 1777, at the battle of Saratoga (Stillwater, Bemis' Heights), in Sullivan's campaign against the frontier Indians and in the Virginia campaign of 1781. He retired from the service with the grade of brigadier. A member of the New York assembly in 1788-90, he was also in 1788 a delegate to the State convention which adopted the Federal Constitution, and in 1791-94 a State senator. From 1793 to 1809 he was a representative in Congress. He accompanied Lafayette in the latter's tour of the States in 1824.

VAN CORTLANDT, Stephanus, American jurist: b. New Amsterdam (New York City), 4 May 1643; d. there, 25 Nov. 1700. He was educated by the Dutch clergy of his day, engaged in mercantile life and became a member of the Court of Assizes on the establishment of an English government (1664). He became a colonel in the King's regiment, was mayor of New York (1677-1700) and held other offices. He also was judge of the Court of Common Pleas in Kings County for several years and was appointed chief justice in 1700, which position he held at the time of his death.

VAN CURLER, Arendt: b. Nijkerk, Gelderland, 6 Feb. 1620; d. drowned in Lake Champlain in 1667. Pioneer in New Netherland, founder of the Dutch peace policy with the Iroquois, initial explorer of the Mohawk Valley,

rescuer of French captives, he first made the settlement of Rensselaerwijk (Albany) a success. Though cousin of the Patroon Van Rensselaer, he educated himself out of a system of semi-feudalism, bought the "Great Flat" from the Indians, led a company of free farmers into the Mohawk Valley and founded the city of Schenectady. The personality of this far-seeing man, one of the builders of the future Empire State, so far transcended his subordinate position under Governor Stuyvesant, that with the Iroquois and the French his enduring fame excels that of many men higher in office. The town (Schenectady), bay (Peru bay), and lake (Champlain) were all called "Corlaer" after him. What was almost unique, as Parkman wrote, is, that his name, meaning "corn ear," was left untranslated, and became the title in the Indian speech, not only of every one of the governors of New York "Corlaer," but also of the sovereign of the British Empire — "Kora-Kowa" (the great Corlaer). In 1909, under the auspices of the Schenectady County Historical Society, with fitting ceremony, there was erected on the walls of the great church in Nijkerk a handsome bronze tablet to Arendt Van Curler's memory. Of the other two Van Curlers in New Netherland, one was Anthony the trumpeter. From the line and a half of history, Irving has constructed the character which in fiction is colossal, and from which the geographical terms, Anthony's Nose, a promontory, and Spuyten Duyvil, a village on the Hudson, are associated. Jacobus Van Curler, a relative of Arendt, a member of the governor's council, commanded in 1633 the Dutch fort, House of Hope, on the Connecticut River, near the site of Hartford. Later he became a schoolmaster on Manhattan, purchased land and after him "Corlaer's Hook" received its name. He returned to Nijkerk. Consult Cuoq's 'Lexique de la Langue Iroquoise' (1882); and Griffis, 'Story of New Netherland.'

VAN DE VELDE, vĕl'dĕ, Adrian, Dutch painter: b. Amsterdam, 1635 or 1636; d. there, 21 Jan. 1672. He was the son of Willem Van de Velde the Elder, under whom he studied, and consequently brother of William Van de Velde the Younger, the famous marine painter. While he continued his training as a landscape painter under Wynants at Haarlem, P. Wouverman taught him to draw and paint figures, and he eventually rose to be one of the most eminent of the Dutch masters. He was equally successful in history, animals, battle-pieces, genre and portraits, but his masterpiece, now in the museum of The Hague, is a landscape in which the figures in the foreground are portraits of himself, his wife and children. His pictures are highly valued by connoisseurs, and 'A Pastoral Scene' (containing cows, a horse, sheep and figures, 13¼ X 12½ inches) was sold in 1842 for $22,575. Other important pictures of his are 'Starting for the Hunt'; 'Winter Landscape'; 'The Siesta,' etc.

VAN DE VELDE, Willem (THE ELDER), Dutch painter: b. Leyden, 1611 or 1612; d. London, 1693. He was in early life a seafaring man, and settling at Amsterdam became famous for his marines in black and white, and in order that he might witness any sea-fight that should take place at a time when the Dutch navy swept the seas, the states of Holland placed at his disposal a small vessel from which he sketched and painted a great many pictures. He was appointed court painter by Charles II of England and his successor, James II, and enjoyed a royal pension until his death. His pictures are almost all in black and white and were excelled by those of his son Willem Van de Velde the Younger, who, however, doubtless used the sketches, studies and drawings left by his father.

VAN DE VELDE, Willem (THE YOUNGER), Dutch painter: b. Amsterdam, 1633; d. Greenwich, 6 April 1707. He gained the delicate sense of color and marvelous power of atmospheric effect from De Vlieger, but his strong drawing and knowledge of marine detail, his faculty of giving motion to waves and ships, he derived from his father, who was, however, no colorist. But while he could paint the storm, foaming waves, angry clouds and scudding vessels he was equally successful in portraying a calm; one such picture catalogued as 'A Calm, Men-of-war at Anchor,' was sold in 1846 for $8,820, and his canvases have always been prized by English critics and connoisseurs, by one of whom he has been styled the "Raffael of Marine Painting." There are some 330 of his works extant, some of which when last they changed hands brought between $10,000 and $14,000. Little is known of the life of this painter excepting that he enjoyed a pension of £100 a year from Charles II who was in every way his liberal patron. His portrait, by Sir Godfrey Kneller, is still in existence. Consult Michel, 'Les Van de Velde' (1892).

VAN DER CAPELLEN, Joan Derck, Dutch champion of American independence: b. at Tiel, 2 Nov. 1741; d. 6 June 1784. He was of a family famous since the 12th century, and descended from the chaplains or Capellani of France. In the 17th century, under Governor Stuyvesant, two men of this name and line were large owners of land on Staten Island and in the country of the Navesink and Raritan Indians. Joan Derck, educated at the University of Utrecht, was a great reader of the political writings of the British Whigs and became a pronounced Liberal, opposed to the pro-British policy of "the Court" and Stadtholder William V. Being in active sympathy with the American colonists, he struck a decisive blow in their behalf when, on 16 Dec. 1775, six months before the Declaration of Independence, as a member of the provincial legislature of Overijssel, he protested against the "Lending of the Scotch Brigade [of three regiments, formed in Queen Elizabeth's time and probably the oldest standing army in Europe] for service in America." For this body of veterans, King George III had in an autograph letter made earnest request. This, Van der Capellen "opposed with all his endeavors," considering the cause of the American colonies was that of all mankind. For this printed speech, he was thanked by Gov. Jonathan Trumbull and many Americans, with whom Van der Capellen kept up an active correspondence. Besides great activity with pen and voice, in attacking some surviving features of feudalism such as the "corvees," or the peasants' forced labor without pay, he worked with John Adams and with van der Kemp, Luzac and others, subscribing

liberally also to American bonds. Later he was active in the Patriot agitation. After his death, his tomb was blown up with gunpowder by his enemies. The loan to the United States, in gold, amounting when paid back, in 1808, to $14,000,000, was invested in lands in western New York and Pennsylvania; so that the Americans got double benefit from the money. On 6 June 1908, the Holland Society of New York unveiled a bronze tablet costing $700 to V. d. Capellen's memory at Zwolle. See the abundant bibliography in Dutch, the collection of over 50 Holland pamphlets in the Boston Athenæum; Fairchild, 'Adrian Van der Kemp' (1903); Griffis, 'The Dutch Our Allies in the Revolution' (Oneida Historical Society 1894); Blok, P. J., 'History of the People of the Netherlands' (Vol. V, 1912).

VAN DER DONCK, Adrian, tribune of the people, the first lawyer in New Netherland and author of the initial illustrated book descriptive of the country: b. at Breda, North Brabant. He was graduated at the University of Leyden. Appointed schout-fiscal or financial inspector of Rensselaerwijk, he served from 1641 to 1646; in which latter year he married the daughter of the Rev. Francis Doughty, an English clergyman who had fled from New England. He was active in peace negotiations between Governor Kieft and the Indians. Desirous of becoming a patroon, in order to have influence in behalf of the people, he tried to purchase an estate at Catskill. Prevented by Van Rensselaer, he went to Manhattan and bought land which was variously called Colendonk, that is, Donck's Colony, the Yonkheer's land, or, as since shortened, Yonkers. His title was confirmed by the states-general. Able and public spirited, he was chosen in 1646 one of the Nine Men to represent the people and to act with the governor. Stuyvesant executed the orders of the Company with such drastic literalness, that in 1649 Van der Donck, acting for the commissioners, wrote out the Remonstrance and Petition to the states-general. In the conflict between autocracy and corporationism on the one hand, and the community on the other, Van der Donck's house was searched, his draft of the Remonstrance seized and he was imprisoned by Stuyvesant. When free, he led the people's delegates and arrived at The Hague before the emissaries of Stuyvesant, stating eloquently the people's plea for self-government. Detained in Holland four years, his alma mater made him a doctor of laws and he practised in the Supreme Court. His book, descriptive of New Netherland, encouraged emigration. It was rich in critically sifted information as to fauna and resources, and he warned against destruction of the forests. In pure description, this work excels anything known in colonial literature. The map of the province and the picture of New Amsterdam in this book are those most often copied and familiar to the average American. On his return, in 1653, to take further part in the struggle for self-government, intending also to write a full history of the colony from the beginning, he was never able to overcome Stuyvesant's implacable hostility or to examine the Company's records. He died in 1655. He was author of the Municipal Board, the true founder of municipality and popular government on Manhattan, and is deserving of the highest memorial honors. The key to his character as to Stuyvesant's is found in the chronic struggle between autocracy and corporationism on the one hand and the people's demand for self-government on the other, which was incarnated in these two makers of New Netherland. His descendants under the name of Onderdonck and Vandunck, or Verdunck, were numerous. His land in later days formed part of Fordham, Philipsburgh and the Van Cortland manor, and the museum in Van Cortland Park standing on or near the site of his old home. Consult Brodhead, 'History of the State of New York' (1859); Van Rensselaer, 'History of the City of New York' (1909); and Griffis, 'The Story of New Netherland' (1909).

VAN DER ESSEN, Léon, Belgian historian: b. Antwerp, 12 Dec. 1883. He was educated at Saint John Berchmans College, Antwerp, and at Louvain University. From 1906 to 1910 he was assistant professor at the Seminary of History, Louvain, after 1910 he was professor of critical history and institutions of the Middle Ages, and after 1912 special professor of the Flemish course in mediæval history and vice-president of the Seminary of History, Louvain University. In 1906–09 Dr. Van der Essen journeyed to Naples and Parma on a scientific mission from the Belgian government. He has published 'Het Ontstaan van Antwerpen' (1905); 'Etude critique et littéraire sur les Vitæ des Saints Mérovingiens de l'ancienne Belgique' (1907); 'De straf — en rechterlijke vergœningsbedevaarten in de Middeneeuven' (1911); 'Geschiedenis der Middeneeuven' (1912); 'Les archives farnésiennes de Naples au point de vue des Pays-Bas' (1907). He collaborated in 'Biographic Nationale de Belgique' (1905); 'A Short History of Belgium' (Chicago 1916), etc.

VAN DER GOES, goos, **Hugo,** Dutch painter: b. Ghent; d. Soignies, near Brussels, 1482. He was in 1465 a member of the Guild of Painters of his native place, serving as dean of the association from 1473 to 1475. He was a follower of Van Eyck, but most of the incidents related of his life have been rejected as fabulous. It is only known that he retired to a monastery, Rooden Klooster, in Belgium and died insane there. The Florence triptych now in the hospital Santa Maria, a 'Madonna and Child with Angels,' is undoubtedly his production.

VAN DER HELST, hĕlst, **Bartholomæus,** Dutch painter: b. Haarlem, 1611 or 1612; d. Amsterdam, 16 Dec. 1670. In Amsterdam he was the pupil of Nicolas Elias. His most famous picture is 'The Banquet of the Civic Guard,' which contains 24 powerful portraits, and was painted to celebrate the Peace of Westphalia (1648). The work is remarkable for life-like expression, masterly drawing and clear, harmonious coloring, and Sir Joshua Reynolds said of it that it was "the first picture of portraits in the world." Numerous portraits by him are met with in the European galleries; among them are that of 'Paul Potter' (at The Hague); 'The Lady in Blue' (in the London National Gallery); and the 'Dutch Burgomaster' (in the Metropolitan Museum of New York).

VAN DER HEYDEN, hī'dĕn (or **HEYDE), Jan,** Dutch painter: b. Gorcum, 1637; d. Amsterdam, 28 Sept. 1712. After studying under a glass painter he turned his attention to architectural landscape on canvas, and taking up his residence in Amsterdam he executed many views of churches, castles, palaces, open squares, streets, canals, etc. These were enriched with elaborate figure groups, mostly painted in by Lingelbach, Van de Velde and Eglon Van der Neer. His works are to be met with in most European public galleries. His chief pictures are 'View of the Town Hall in Amsterdam' and 'View of the Dam Square.'

VAN DER HOEVEN, hoo'vĕn, **Jan,** Dutch scientist: b. Rotterdam, 9 Feb. 1801; d. 10 March 1868. He studied natural history and medicine at Leyden and continued his studies in zoology at Paris and returned to his native town as a practising physician, but in 1835 was appointed professor of zoology at Leyden University, a position he held till his death. He published many works on his special subject, the chief of which was 'Handboek der Dierkunde' (Handbook of Zoology, translated by Professor Clark of Cambridge).

VAN DER KEMP, Francis Adrian, Dutch-American writer and clergyman: b. Kempen, Holland, 1752; d. Barneveld, N. Y., 1829. He received his education in the schools of Holland and graduated at the University of Groningen. In 1777 he became minister of a church in Leyden. From the first, in religion and politics he became a leader of the Liberal party. He joined the armed forces that were trying to gain political freedom from the Orange party. He was taken prisoner and placed in prison, but was released in 1787. In 1788, having secured letters of introduction from John Adams and Lafayette, he came to America and lived for six years at Esopus on the Hudson. In 1794 he moved to Barneveld, N. Y., where he passed his life, farming. He was chosen a member of many learned societies and given an honorary degree of LL.B. by Harvard in 1820. He wrote many articles and also an autobiography, which though never published yet furnished material for a "Memoir" written in 1903 by Mrs. Helen L. Fairchild. Many of his original manuscripts are in the possession of the historical societies of Buffalo and Philadelphia, and a few are in the library of Columbia University.

VAN DER MEER, Jan, of Delft. See VERMEER, JOHANNES.

VAN DER MEULEN, mĕl'lĕn, **Adam François,** Dutch painter: b. Brussels 1632; d. Paris, 15 Oct. 1690. After learning the principles of his art in the studio of P. Snayers (q.v.) he was introduced by Lebrun to Minister Colbert, who commissioned him to paint several pictures for his private gallery and made him superintendent of the Gobelin tapestry manufactory. He subsequently as court painter accompanied Louis XIV on his campaigns in Flanders for the purpose of painting the most important scenes of the war. A great number of battle pieces, which are crowded with figures, are now in the Louvre and in the gallery at Versailles, others are at Munich, Dresden and Saint Petersburg. A good example of his skill as a battle painter is his 'Rencounter of Cavalry,' a small but exquisite canvas in the New York Metropolitan Museum.

VAN DER POORTEN-SCHWARZ, vän dĕr pōr'tĕn shvärts, **J. M. H.,** Dutch novelist. See MAARTEN MAARTENS.

VAN DER STUCKEN, stoo'kĕn, **Frank,** American musical director: b. Fredericksburg, Tex., 15 Oct. 1858. He studied at the Conservatory of Music, Antwerp, 1881–82, and became Kapellmeister at the Stadt Theatre, Breslau, Germany. In 1884 he became leader of the Arion Singing Society of New York and in 1892 accompanied it on a concert tour through Europe. He was dean of the College of Music of Cincinnati 1897–1901 and honorary dean from 1901; and in 1905 succeeded Theodore Thomas as musical director of the Cincinnati May Festivals. Among his musical compositions are the opera 'Vlasda,' 'Festival March,' 'Festival Hymn,' 'Inauguration March,' 'Pagina D'Amore,' the latter an orchestra episode.

VAN DER WEYDEN, wī'dĕn, **Rogier** (also known as ROGER DE BRUGES, ROGER DE BRUXELLES, RUGGIERO DA BRUGIA, MAESTRO ROGEL and ROGER DE LA PASTURE), Flemish painter: b. Tournay, Belgium, about 1400; d. Brussels, 16 June 1464. He was the pupil of the painter Robert Campin in Tournay (1427), and five years later was made master of the Guild of Saint Luke in his native city. In 1436 he went to Brussels and was appointed municipal painter. He attended the jubilee at Rome in 1450, and after studying the Italian masters and antiques of Italy and painting several pictures for Italian patrons, one of whom was Cosmo de Medici, returned to Belgium and settled at Brussels. All of his pictures are distinguished by a profoundly religious spirit. They are designed and drawn with great care and power; the modeling is firm and smooth, the technique brilliant, but there is a certain dryness and leanness in the limbs, hands and feet of his figures, which sometimes almost amounts to distortion and deformity, and is only half redeemed by the beauty of his faces whose expression is radiant with faith and celestial inspiration. He was the founder of the Brabant school of painting and had numerous pupils and followers, among them Memling, as well as foreigners who learned from him the use of oils in painting and helped to spread the new method and other characteristics of the Flemish studios. His chief paintings are 'The Descent from the Cross,' originally painted for the church of Our Lady of Victories, at Louvain, now in the Escorial, a copy being also in the Prado Gallery; a triptych with the figure of the 'Dead Christ' in the central panel; and altarpiece for Saint John's chapel in the church at Middleburgh; 'The Adoration of the Shepherds' (all three in the museum at Berlin); and the triptych with a 'Crucifixion' in the centre in Imperial Gallery at Vienna; the 'Last Judgment' in the hospital at Beaune; and the 'Seven Sacraments' at Madrid. In the Pinakothek at Munich are to be seen his 'Adoration of the Three Magi'; and 'Saint Luke Painting the Portrait of the Madonna.' Consult Wautrs, 'Roger Van der Weyden, ses œuvres, ses élèves et ses descendants' (1856).

VAN DEVANTER, Willis, American lawyer: b. Marion, Ind., 17 April 1859. He was graduated at Asbury College (now De Pauw University) in 1878 and at the Cincinnati Law School in 1881. He began practice in Marion (1884); moved to Cheyenne, Wyo., and was commissioned to revise the Wyoming statutes (1885) and was city attorney there (1887–88). He was chief judge of the Supreme Court of Wyoming (1889–90); circuit judge (1903–10) and associate judge of the Supreme Court of the United States from 1910 by appointment from President Taft. His decisions on important railroad and corporation cases in connection with the Sherman Anti-Trust Law attracted wide attention.

VAN DIEMEN, dē'mĕn, **Anthony,** Dutch colonial administrator: b. 1593; d. 1645. Having gone to India, he soon rose to the highest dignities and in 1636 was made governor-general. He administered the government with ability and contributed much to the establishment of Dutch commerce in India. The navigator, Abel Tasman, whom he sent with a vessel to the South Seas in 1642 gave the name of Van Diemen's Land to the island now called Tasmania, but in 1853 it was renamed for its discoverer.

VAN DIEMEN'S LAND. (văn or văn dē'mĕnz) See TASMANIA.

VAN DORN, Earl, American soldier: b. near Port Gibson, Miss., 17 Sept. 1820; d. Spring Hill, Tenn., 8 May 1863. He was graduated at West Point in 1842 and served in the American army with distinction during the Mexican War. Early in 1861 he joined the Confederate army, captured the steamer *Star of the West* at Indianola and becoming major-general in January 1862 commanded the Trans-Mississippi district. He suffered defeat at Pea Ridge and being transferred to the Army of the Mississippi was again defeated at Corinth. He was shot during a dispute and died shortly after.

VAN DUZER, Lewis Sayre, American naval officer: b. Elmira, N. Y., 29 June 1861. He was graduated at the Naval Academy (1880) and was promoted through various grades of the service to a captaincy (1911). He served in several important positions and was present as officer of the battleship *Iowa* at the destruction of Cervera's fleet (1898); also in the attack on the fortifications of San Juan, Porto Rico. He served in the Philippines (1898–1900), and in China (1900) during the Boxer Rebellion. From that time he occupied important positions, being instructor in ordnance in the Naval Academy, executive officer of the steamships *Marietta* and *Newport,* was executive officer of the naval torpedo station at Newport, R. I., commandant of the navy yard at Olongapo, P. I., and of the navy yard at New York (1910–13) and was in command of the battleship *Utah* in 1914 when he was retired at his own request. He received numerous medals. He edited the 'Army and Navy Year Book' for several years, etc., and was author of important technical contributions to periodical literature and standard reference works.

VAN DYCK, dīk, **Anthonis,** Flemish painter: b. Antwerp, 22 March 1599; d. London, 9 Dec. 1641. He was born of wealthy parents, his father being Frans Van Dyck, a prominent silk merchant. Young Van Dyck very early displayed a fondness for drawing and especially for the sketching of faces, for which he showed such talent that his father sent him, at the age of 10, as a resident pupil to the noted painter and art teacher, Hendrik Van Balen, where he made such rapid progress that at the age of 16 he had gone into partnership in Antwerp with Jan Brughel the younger as portrait painter and general artist. He is said to have inherited much of his artistic talent from his young mother, Maria Cuypers, his father's second wife, who was noted in Antwerp for her wonderful skill and taste in the making of embroidery, much of her work in this field being real art creations. Van Dyck was not long a free lance when he attracted the attention of Rubens, who was so impressed with the boy's talent that he took him into his own household and made him his assistant. This pleased young Van Dyck, his father and his mother and the precocious pupil of the great Flemish master made rapid progress. He had wonderful power of exact observation and ability for reproduction, and his imitation of Rubens' work was so well done that to-day it is extremely difficult to distinguish the paintings of the pupil from those of the master. Before he had reached his majority Van Dyck had already become famous in his own country and had begun to attract attention outside of it. At the age of 19 he was elected a member of the Painters' Guild and the following year he went to England on the invitation of the Earl of Arundel, who had formed a very high opinion of his talent and the superior quality of his work. Through the influence of the latter he secured a pension from the English king, James I. This introduction to the English court was of very considerable influence on his future career. He remained two years in England where he greatly increased his reputation and became very popular. The English anglicised his name to Anthony Vandyke, a title under which he was destined to acquire undying fame throughout all English-speaking lands. The longing to see the great southern art capitals took Van Dyck to Italy (with the permission of the English sovereign) in 1622, where he visited Venice and Genoa and where he received a warm welcome, studied the old masters and produced fine pictures of his own, especially portraits of celebrities, among them artists, rulers, statesmen and princes. His portraits of the Genoese nobility are especially notable and of great historic value because of the masterly manner in which he has reproduced the customs, dress, habits and spirit of the Italian ducal courts. Van Dyck made a most careful, detailed and loving study of the Venetian masters; and the influence of this study of Italian art was deeply reflected in his own work which became more artistic in almost every sense of the word. Under the influence of the great Italian painters of the day he gradually changed his style for the better, making it brighter, more realistic, softer, more refined and more human. His wonderful power of absorption stood him in as good stead in Italy as it had under the tuition of Rubens in his boyhood. In a word, he seized the spirit of Italian art, so different from that of his own Flemish land in which he had been educated.

This is one of the greatest signs of his genius. This Italian period of his life was wonderfully prolific and resulted in many portraits of royal personages, which still adorn the walls of Italian ducal palaces and museums where they are held in high estimation. He worked in the art and picture galleries of Turin, Rome and probably other Italian cities; and everywhere he had the patronage of the local nobility, for sitting for portraits to Van Dyck had become the fashion of the day in courtly circles. On invitation of Albert and Isabella, Spanish regents of the Netherlands, he returned to the land of his birth as court painter; and here again he continued his triumphant art procession, painting all the local celebrities of his day without allowing his popularity to appreciably lower the high standard of his work. In 1631 Van Dyck went to Holland where he was literally received with open arms and where he painted the portraits of notable persons, among them Prince Henry of Orange and his queen, Prince Charles Louis and Prince Rupert of Bohemia (both then in exile).

The Earl of Arundel and the English king had, for some time, been trying to persuade Van Dyck to return to England, and finally, in 1632, they were successful. The great Flemish artist was received with all the honors that could be accorded to the ambassador of a foreign court. A fine residence, the property of the sovereign, was given to him in London (Blackfriar's district) and the royal favor went so far as to assign him apartments in the royal palace of Eltham, and to appoint him painter in ordinary to the royal household, with a pension of £200 a year, then a large sum of money. Thus encouraged to do his best, honored with the high esteem of the English sovereign and his consort and praised by the British nobility led by the Earl of Arundel, Van Dyck now began the most notable of his many notable series of portraits. These include numerous portraits of the king, the queen and their children. Van Dyck seems to have been very happy and to have put into his work all his love of art, his cultured imagination and the wonderful art knowledge and technique he had acquired from constant contact with the paintings of schools so far apart as the Netherlands and Italy.

In 1634 Van Dyck returned to Antwerp where he remained actively at work for over two years. There he painted many notables and produced some of his most characteristic groups, now among the glories of Flemish achievements in art. From 1636 to 1640 he was again back in England, where he busied himself painting portraits for most of the notable personages of the court, so that there are literally scores of fine Van Dyck portraits scattered throughout the palaces of the British nobility. So popular was Van Dyck, at this period of his career, that it was a physical impossibility for him to have executed all the pressing commissions given him. The result is that he very often simply sketched his subject, painted the features and left the execution of the rest of the picture to skilled pupils and followers of his school. He invariably, however, retouched this pupils' work, where he found it not to his fine artistic taste. In 1641 Van Dyck went to Paris where he hoped to get a commission to decorate the Louvre for which he had conceived an elaborate plan; but he was disappointed. This probably increased his already poor health and he died the following year at a comparatively young age, but easily the foremost name in art of his latter years.

Van Dyck is par excellence the ideal portrait painter. While remaining true always to his subject, he had the power of casting round it a glamor which lent an air of distinction to his portraits of princes of the State and Church, of sovereigns and nobles. By instinct he was himself an aristocrat and the position he maintained as the autocrat of his profession increased this inborn tendency and gave him a very broad and deep interest in the true artistic interpretation of the men of noble family and high estate that he may be said to have spent his life transferring to canvas. His portraits of the unfortunate Stuart, Charles I of England and the cavaliers who so strenuously supported his cause, have done more to immortalize them and to maintain an interest in and a sympathy for them than any one other agency. Through them we form a definite visual picture of the court of Charles I and of the upper-class society of his day, such as we are unable to visualize of any previous period in English history. His influence upon English art, and especially upon portrait painting, was greater and more lasting than that of any previous painter. Yet so peculiarly his own was his style of painting and so consummate was his art that while he had hundreds of imitators, many coworkers and numerous pupils, he may be said to have created no school. This is because his supreme excellences is to be found in his mystical poetic touch, his idealization and his mingling of the broad, striking dramatic realism of the Flemish painters, generally translated into action and the softening, refining imaginative, poetic temperament of the South. No artist could imitate Van Dyck as Van Dyck constantly imitated, in such a realistic manner, the work of his first great master, Rubens, and the notable painters of the Italy of his day. This is because Van Dyck, Janus-like, was constantly presenting two faces, one looking toward the long past, bold, dramatic and realistic influences of his youth; and the other following the refining, softening and ennobling principles of the southern lands that were rapidly making of Italy the home of modern, as she had long been, one of the two great centres of ancient art. To outline the many existing works of art from the brush of Van Dyck would require catalogue space greater than the necessary limits of this article. His paintings, and especially his portraits, are to be found in every country of Europe and numerous examples exist in the United States and Latin America. Among his notable works, however, are 'Jacobus de Wael and his Wife' (Munich), his brilliant portraits of Genoese nobility, of Charles I, king of England and of 'Queen Henrietta'; 'Cardinal Bentivoglio' (Rome); 'Portrait of A Lady and a Child' (Morgan Collection, Metropolitan Museum, New York City); 'Philip of Savoy, Viceroy of Sicily' (Turin). Other portraits of members of the same noble family, most of which are still in Turin; 'Madonna del Rosario' (very famous, in the Oratorio del Santissimo Rosario, Palermo); 'Raising of the Brazen Serpent' (Madrid); 'Christ on the Cross' (Antwerp

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Museum); 'Pietà' (Vienna, Munich, Antwerp). Van Dyck's works have become generally known through the excellent engravings made of the best of them. He was himself one of the cleverest engravers of his day, and had he not given his best work to his paintings he might easily have attained a place second to none in the graver's art. His etchings are very superior works of art. He was a master of the technique of drawing and this gave him an unusual advantage over most of his contemporaries even in etching. This enabled him to direct, with wonderful skill, many of the best engravers of his day, whom he employed for the engraving of heads of noted personages of the different countries of Europe. In this work he frequently himself handled, with consummate skill, the graver's tools; and the original sketches and drawings for these notable works were his own. As issued by Hendricx these engravings numbered 100 (1645). The last of 17 editions appeared in 1759 (with 124 plates).

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VAN DYCK, Cornelius Van Allen, American missionary and translator: b. Kinderhook, N. Y., 1818; d. 1895. He was graduated at Jefferson Medical College, Philadelphia (1839), and went as a medical missionary to Syria the next year. In 1846 he was ordained a minister, became master of the Arabic language and translated the Bible into that tongue. While his Bible was being printed he taught Hebrew in the Union Theological Seminary, New York (1866–67). He was manager of the mission press at Beirut, physician to Saint John's Hospital and professor of pathology in the Syrian Protestant College (1857–82), and made many translations of medical and other texts into the Arabic.

VAN DYKE, Henry (Jackson), American Presbyterian clergyman and author: b. Germantown, Pa., 10 Nov. 1852. He was graduated at Princeton (1873), the Princeton Theological Seminary (1877) and the University of Berlin (1878); was pastor of the United Congregational Church of Newport, R. I., in 1878–83; and of the Brick Presbyterian Church, New York, from 1883 until his resignation in 1900 to become professor of English literature in Princeton University. He was moderator of the General Assembly of the Presbyterian Church in the United States in 1902–03. He became favorably known as both preacher and popular lecturer, and in addition to publishing several works of religious character contributed much also to general literature. In 1908 he delivered a course of lectures at the University of Paris. He went to the Netherlands as United States Minister in 1913. He resigned in 1917 and returned to Princeton. The titles of his volumes include 'The Reality of Religion' (1883); 'The Story of the Psalms' (1887); 'The Poetry of Tennyson' (1889; 5th rev. ed., 1894); 'Little Rivers' (1895), a collection of essays; 'The Gospel for an Age of Doubt' (1896); 'The Builders and Other Poems' (1897); 'Ships and Havens' (1897); 'The Lost Word' (1898); 'Fisherman's Luck' (1899); 'The Toiling of Felix, and Other Poems' (1900); 'The Poetry of the Psalms' (1900); 'The Blue Flower,' short stories (1902); 'The School of Life' (1905); 'Days Off' (1907); 'Out of Doors in the Holy Land' (1908); 'Le Genie de l'Amerique' (1909); 'Collected Poems' (1911); 'The Unknown Quantity' (1912); 'Grand Canyon' (1914); 'The Valley of Vision' (1919); 'The Broken Soldier and the Maid of France' (1919).

VAN DYKE, John Charles, American art critic and librarian: b. New Brunswick, N. J., 21 April 1856. He was privately educated and in 1877 was admitted to the New York bar, but soon gave his attention to literature, and since 1878 has been librarian of the Sage Library, New Brunswick. For many years he studied art in Europe, has lectured at various universities on art topics and is professor of art at Rutgers College. He has published 'Books and How to Use Them' (1833); 'Principles of Art' (1887); 'How to Judge of a Picture' (1888); 'Serious Art in America' (1890); 'Art for Art's Sake' (1893); 'History of Painting' (1894); 'Old Dutch and Flemish Masters' (1895); 'Modern Flemish Masters' (1896); 'Nature for its Own Sake' (1898); 'Italian Painting' (1902); 'Old English Masters' (1902); 'The Meaning of Pictures' (1903), etc.

VAN DYKE, Paul, American Presbyterian clergyman and educator, brother of H. Van Dyke (q.v.): b. Brooklyn, N. Y., 25 March 1859. He was graduated from Princeton in 1881, was pastor of the North Presbyterian Church, Geneva, N. Y., 1886–89, professor of ecclesiastical history at Princeton Theological Seminary, 1889–92, pastor of the Edwards Congregational Church, Northampton, Mass., 1892–98, and since the date last named has been professor of modern European history at Princeton University. He has published 'The Age of the Renascence'; 'Renascence Portraits.'

VAN EYCK, Hubert. See EYCK, HUBERT VAN.

VAN EYCK, Jan. See EYCK, JAN VAN

VAN GOYEN, văn goi'ĕn, **Jan Josephszoon,** Dutch painter and etcher: b. Leyden, 13 Jan. 1596; d. The Hague, in April 1656. His numerous landscapes and marines are to be found in most European galleries and in the Metropolitan Museum of New York; his 'Moerdyck' and 'Panoramic View of the Environs of Haarlem' are good examples of his style. His pictures are generally painted in a tone which dominates all variegations of color — a rich brown, a tawny gold or a chilly silver tone, and he has been called the earliest "tone-painter" of the Dutch school. There is always genuine feeling in his shore landscapes, sand-hills, canals, rivers and village views, while his city scenes are lit up with animated figures. His etched landscapes are rare, and he is only known to have produced five plates. Among his pupils were Jan Steen and S. Ruysdael.

VAN HISE, văn hīz, **Charles Richard,** American geologist; b. Fulton, Wis., 29 May 1857; d. Milwaukee, Wis., 19 Nov. 1918. He was graduated from the University of Wisconsin in 1879, was instructor in metallurgy there 1879–83, assistant professor 1883–86 and full professor from the last-named date, exchanging the chair of metallurgy for that of geology in 1888. He was non-resident professor of structural geology at the University of Chicago, 1892–1903, has been connected with the United States Geological Survey from 1883 and was consulting geologist of the Wisconsin Geological Survey from 1897. Among his professional publications are 'Correlation Papers: Archean and Algonquin' (1892); 'Principles of North American Pre-Cambrian Geology' (1896); 'The Marquette Iron-Bearing District of Michigan,' with Bayly and Smith (1897); 'The Conservation of the Natural Resources of the United States' (New York 1910); 'Concentration and Control: A Solution of the Trust Problem in the United States' (London 1912).

VAN HOONACKER, hoo-näk'ĕr, **Albin August,** Belgian Biblical scholar: b. Bruges, 19 Nov. 1857. He was educated at the College of Saint Louis, Bruges, the Roulers Preparatory Seminary and the University of Louvain. In 1880 he was ordained to the priesthood and in the same year was professor of humanities at Saint Louis College, Bruges. Subsequently he was curate at Saint Martin's, Courtrai, and in 1887–89 was vice-regent of the College of the Holy Ghost, Louvain University. After 1889 he was professor of the critical history of the Old Testament and Hebrew, and after 1894 held also the chair of Assyrian and moral philosophy at Louvain University. Dr. Van Hoonacker has published 'Observation critiques sur les récits concernant Biléam' (1888); 'L'origine des quatre premiers chapters du Deutéronome' (1889); 'Néhémie et Esdras' (1890); 'Néhémie en l'an 20 d'Artaxerxes I Esdras en l'an y d'Artaxerxes II' (1892); 'Zorobabel et le second temple' (1892); 'Le vœn de Jephté' (1893); 'Le lieu du culte dans la législation rituelle des Hébreux' (1894); 'Nouvelles études sur l'histoire de la Restauration juive après l'exil de Babylone' (1896); 'Le sacerdoce lévitique dans la loi et dans l'histoire des Hébreux' (1898); 'Le traité du philosophe syrien Probus sur les premiers Analytiques d'Aristote' (1900); 'Notes sur l'histoire de la Restauration juive après l'exile de Babylone' (1901); 'Une question touchant la composition du livre de Job' (1903); 'La prophétie relative à la naissance d'Immanu-El' (1904); 'Les douze Petits Prophètes traduits et commentés' (1908), and contributions to encyclopedias and reviews.

VAN HORNE, văn hôrn, Sir **William Cornelius,** Canadian railway official: b. near Joliet, Ill., 3 Feb. 1843; d. 1915. He was employed in various capacities on several lines until 1880, when he became general superintendent of the Chicago, Milwaukee and Saint Paul system. In 1882 he accepted the position of general manager of the Canadian Pacific Railway, and from 1888 to 1899 served as its president. From 1899 to 1910 he was chairman of the board of the company. In 1894 he was knighted. The Canadian Pacific Steamship Company was largely developed by him, and in the promotion of steamship traffic with Australia, as well as in other enterprises, he has rendered efficient services. He was conspicuous in his opposition to the United States-Canadian reciprocity agreement advocated by President Taft.

VAN INGEN, William Brantley, American mural painter: b. Philadelphia, Pa., 1858. He studied under leading Pennsylvania and New York artists and Leon Bonnat, Paris. He began as assistant to John La Farge of New York but soon undertook personal commissions and became widely known from his work at the capital at Washington, at the United States Mint, Philadelphia; the State Capitol at Harrisburgh; the State Capitol at Trenton, N. J., and the courthouse and post office at Indianapolis and Chicago. On a commission from Charles T. Yerkes of New York he visited Japan to make studies for a room in his residence.

VAN LAER, Alexander Theobald, American artist and lecturer: b. Auburn, N. Y., 9 Feb. 1857. He was an art student at the National Academy of Design in New York under Poggenbeek in Holland. His work, chiefly of Connecticut landscapes in the vicinity of Litchfield, his home, was awarded medals at leading American exhibitions. Notable examples are 'A Connecticut Hillside' in the National Gallery, Washington; 'February Snow' in the Brooklyn Museum, New York City; 'On the Brandywine' in the Herron Art Institute, Indianapolis. He was a member of the International jury of awards at Saint Louis (1894); lectured on art history at Chautauqua, N. Y., and appeared in the art lecture courses in New York for 24 years, and before schools and colleges in the leading cities of the country. He was elected a member of the National Academy in 1900.

VAN LENNEP, Henry John, American missionary: b. Smyrna, Turkey, 18 March 1815; d. Great Barrington, Mass., 11 Jan. 1889. He was of Dutch descent, was graduated from Amherst in 1837, studied theology at Andover and in 1839–69 was a missionary in Turkey. He was conversant with most of the Oriental languages, and during the greater share of his residence in Turkey he was connected with educational institutions at Constantinople, Smyrna and Tocat. The loss of his sight compelled him in 1869 to return to the United States, where he engaged in literary work and in teaching. He occupied the chair of natural

science, Greek and modern languages at Ingham University, Le Roy, N. Y., in 1876–78 and from then until his death was principal of Sedgwick Institute, Great Barrington, Mass. He published 'Travels in Asia Minor' (1870); 'Ten Days Among the Greek Brigands' (1874); 'Bible Lands' (1876), etc.

VAN OSTADE, Adrian. See OSTADE, ADRIAN VAN.

VAN PELT, John Vredenburgh, American architect: b. New Orleans, 24 Feb. 1874. He studied architecture at the École des Beaux Arts, Paris, exhibited in the Paris Salon, section of architecture, 1895–96, and in the section of painting in 1898. He was assistant professor of architecture in charge of design at Cornell 1897–1900 and from 1902 to 1904 was in charge of the College of Architecture there. He has written 'Discussion of Composition as Applied to Art' (1902).

VAN RAALTE, Dutch clergyman and leader of the modern Pilgrim Fathers of Holland into Michigan: b. 17 Oct. 1811; d. 7 Nov. 1876. When the bigoted King William I (q.v.) of the Netherlands attempted a rôle like that of the Tudors of England, in order to bring the rather democratic Reformed Church under the control of the state, resistance was made to what was regarded as usurpation. In the north, in Friesland especially, there was resistance and the Separatists from the established Church sought refuge in America. One party, led by Rev. H. P. Scholte, came by way of New Orleans, in 1846 and 1847, to settle in Pella and other places in Iowa. Rev. A. C. van Raalte, in 1846, came to America leading the vanguard of a great host which followed later. They made homes in Holland, Zeeland, Friesland and many other places in Michigan and Wisconsin, in which one may now count scores of Netherland names. Some began the industry of woodworking, which, in its development, has made Grand Rapids (q.v.) the "furniture capital" of the world. In 1850, a classis of the Reformed Church in America, with 13 churches and minister, was formed, which has developed into a body of several hundred thousand communicants. Other Dutch people of this emigration found homes in American cities, East and West, but until his death, van Raalte was the soul of the movement in its educational, religious and economic phases of expansion. Consult Corwin, 'Manual of the Reformed Church in America' (1879); and Dosker, 'Levensschets van C. A. van Raalte' (1893; p. 335).

VAN RENSSELAER, rĕn'sĕ-lĕr, **Kilaen or Killian,** Dutch colonizer in the New World: b. Amsterdam, 1595; d. there, 1644. He was a diamond and pearl merchant at Amsterdam; was a founder of the Dutch West India Company, to which on two occasions he advanced sums for the maintenance of its credit; and sent a representative to New Netherlands to negotiate with the Indians for the purchase of territory on the west bank of the Hudson, extending from Smack's Island to a point 12 miles south of Albany (Beeren, or Bear's Island), and into the interior two day's journey. This purchase was later increased by that of territory on both sides of the river northward and southward from Fort Orange. This tract (Rensselaerswyck) comprised in all a large part of the counties of Rensselaer, Columbia and Albany. Van Rensselaer did not visit it, but managed all its affairs through an agent. He sent Adriaen van der Donck as sheriff of the colony established there, and Dominie Megapolensis for the "edifying improvement" of Dutch and savages.

VAN RENSSELAER, Mariana Griswold, American author; b. New York, 1851. She was known through her writings as a student and critic of art, and also participated in discussions bearing upon politics, etc. She was president of the New York Public Education Association. Columbia University gave her the degree of Litt.D. in 1910. Her publications include 'Henry Hobson Richardson and His Works' (1888); 'English Cathedrals' (1893); 'Six Portraits'; 'Art Out of Doors' (1893); 'Should We Ask for the Suffrage?' (1894) — against woman suffrage; 'One Man Who was Content' (1896); 'Niagara: a Description' (1901); 'History of the City of New York in the 17th Century' (1909); 'Poems' (1910). She was married to Schuyler Van Rensselaer in 1873.

VAN RENSSELAER, May King, American writer: b. New York, 25 May 1848. She was educated privately and was married to John King van Rensselaer 4 Oct. 1871. She has published 'Crochet Lace' (1882); 'The Devil's Picture Books' (1887); 'The Goede Vrouw of Mana-ha-ta' (1889); 'Van Rensselaers of the Manor' (1889); 'New Yorkers of the 19th Century' (1899); 'History of Newport' (1905); 'Nonsuch Euchre and Other Games' (1907); 'Prophetical, Educational and Playing Cards' (1913).

VAN RENSSELAER, Stephen, American politician and soldier, known as "The Patroon"; b. New York, 1 Nov. 1764; d. Albany, 26 Jan. 1839. He was fifth in lineal descent from Killian Van Rensselaer (q.v.), the original patroon of the Dutch colony of Rensselaerswyck. He entered Princeton College in 1771, but owing to the proximity of the British army was removed to Harvard, where he was graduated in 1782. In 1789 he was elected to the assembly, and the next year to the State senate, to which he was re-elected annually till 1795, when he was chosen lieutenant-governor and served till 1801. He presided over the State Constitutional Convention of 1801 and in 1808–10 was again in the assembly. He was made major-general of the State militia, and in 1812 directed the assault upon Queenstown, Canada. After the war he joined with DeWitt Clinton (q.v.) in the construction of the Erie Canal, for exploring the proposed route of which he had been one of a commission in 1810–11, and from 1816 till his death was one of the board of canal commissioners, and for 15 years was its president. He was again a member of the legislature in 1816, in 1819 was elected a regent of the University of the State of New York, and was subsequently its chancellor. In 1821–23, at his own expense, he employed Professors Eaton and Hitchcock to make geological and agricultural surveys of a large part of the State. In November 1824 he provided suitable buildings at Troy, and established a scientific school for the instruction of teachers. This school was incorporated in 1826 as the Rensselaer Polytechnic Institute, and he continued to aid in supporting it until the end of his life. From

1823 to 1829 he was a member of Congress. He published 'A Geological and Agricultural Survey of the District Adjoining the Erie Canal' (1824). Consult Barnard, 'A Discourse of the Life, Services, and Character of Stephen Van Rensselaer' (1839).

VAN REYPEN, rī'pĕn, **William Knickerbocker,** American naval officer: b. Bergen, N. J., 14 Nov. 1840. He was graduated from the medical department of the New York University 1862, and the same year served at the Naval Hospital in New York. He represented the medical department of the United States navy at the international medical congress at Moscow 1897, and during the war with Spain designed and fitted out the first ambulance ship ever used in naval warfare. He was retired in 1902 after 40 years' service with the rank of senior rear-admiral. In 1905 he was chairman of the American National Red Cross Association.

VAN SANT, Samuel R., American statesman and soldier: b. Rock Island, Ill., 11 May 1844. At the outbreak of the Civil War he enlisted in the Union army and served for three years. He was elected to the legislature 1892 and 1894 and was speaker of the same body 1895. In 1901 he was elected governor of Minnesota.

VAN SANTVOORD, George, American lawyer and author: b. Belleville, N. J., 8 Dec. 1819; d. 6 March 1863. He was graduated at Union College in 1841, studied law at Kinderhook, N. Y., was admitted to the bar in 1844 and practised at Kinderhook from 1846 to 1851, when he removed to Troy, N. Y. In 1852 and in 1856 he was a member of the Assembly, and in 1860–63 was district attorney of Rensselaer County. His writings include 'Life of Algernon Sydney' (1851); 'Principles of Pleading in Civil Actions Under the New York Code of Procedure' (1852); 'Lives of the Chief Justices of the Supreme Court of the United States' (1854); and 'A Treatise on Practice in the Supreme Court of the State of New York in Equity Actions' (1860).

VAN SHAACK, shăk, **Peter,** American lawyer: b. Kinderhook, N. Y., March 1747; d. there, 27 Sept. 1832. He was graduated from King's (now Columbia) College in 1766, was admitted to the bar in 1769, and established a law practice in New York. In 1773 he was appointed to revise the statutes of the colony of New York, and he later served on various committees for the consideration of the measures of the British government which resulted in the Revolution. Although greatly incensed at the action of the government he was nevertheless opposed on general principles to the Revolution and in 1777 was summoned before the board of conspiracies to take the oath of allegiance to New York. On refusing he was sent to Boston. In 1778 he was banished, and went to England where he remained until 1785. He was then restored to citizenship in New York and readmitted to the bar. He gained a high reputation in his profession and also as an instructor in his law school. He was totally blind during the last years of his life. Among his publications are 'Laws of the Colony of New York' (2 vols., 1773); 'Conductor Generalis, or the Duty and Authority of Justices, Sheriffs, Coroners, etc.' (1788). Consult Van Shaack, H. C., 'Life, Journal and Letters of Peter Van Shaack' (1842).

VAN 'T HOFF, Jacobus Henrik, Dutch chemist: b. Rotterdam, 1852; d. 1908. He was educated in the University of Leyden and also studied in Bonn and in Paris. His thesis (1874) on the "stereochemical" theory revolutionized work on molecular structure and his subsequent studies won for him the first Nobel prize in chemistry (1901). He was made honorary professor in the Berlin Academy of Science where he was enabled to establish a laboratory for research work and was specially successful in the study of geological phenomena and of the formation known as the Stassfurt salt deposits. He was the first to point out the analogy between the gaseous state and that of dilute solutions, thus laying the basis for the great development of physical chemistry. With his students he contributed for 10 years to the Proceedings of the Academy of Sciences of Berlin the results of their studies, which resulted in the complete solution of the problems attacked.

VAN TWILLER, Wouter, or Walter, Dutch governor of New Netherland: b. Nieukirk, about 1580; d. Amsterdam, after 1646. He was a clerk in the warehouse of the West India Company at Amsterdam when he was chosen to succeed Peter Minuit as director-general of New Netherland. He arrived at the colony in April 1633, bringing with him the Spanish caravel, *San Martin*, captured on the voyage. Van Twiller was incompetent for his new post and in his administration there was considerable to warrant the well-known burlesque of Irving in 'Knickerbocker.' But he devoted much attention to internal improvements, repaired Fort Amsterdam, built new windmills and other structures, secured large grants from the Indians, extended the trade with the West Indies and New England and displayed many other excellent activities. He was also alert in defense of the fur trade, by which the colony was realizing large profits. In 1633 Eelkens, who had been commissary at Fort Orange, sailed up the Hudson to within a mile of the fort in an English vessel, the *William*, bent on a trading enterprise for English capitalists. Van Twiller soon convoyed the *William* out to sea with the Dutch fleet and prevented the establishment of English trade upon the river. When Winthrop wrote asserting the superior title of the English to the Connecticut Valley, Van Twiller, in a "very courteous and respectful" letter, suggested that the matter should be adjusted by the English king and the States-General. However, without Winthrop's assent, New Plymouth sent to Connecticut an expedition commanded by Lieut. William Holmes which passed up the river by the Dutch Fort of Good Hope and began at Windsor the first English settlement in Connecticut. Van Twiller was removed in 1637 and succeeded by William Kieft. He held a large estate in the colony and was an opponent of Stuyvesant in 1650.

VAN TYNE, Claude Halstead, American author: b. Tecumseh, Mich., 16 Oct. 1869. He graduated at the University of Michigan in 1896, was instructor in history at the University

of Pennsylvania 1900–03 and later professor of American history at the University of Michigan. He has written 'Brief History of the United States of America' (1900); 'The Loyalists in the American Revolution' (1902); 'The American Revolution' (1905); edited 'The Letters of Daniel Webster' (1902), and has been a prolific contributor of historical topics to standard reference works.

VAN VLECK, Edward Burr, American mathematician: b. Middletown, Conn., 7 June 1863. He took his degree in Wesleyan University (1887); was graduate student of mathematics (1887); Fellow of Johns Hopkins, and student of mathematics in Göttingen (1890–93), and doctor of mathematics, University of Groningen (1914). He became professor of mathematics in the University of Wisconsin in 1906. He is author of 'Theory of Divergent Series and Algebraic Continued Functions' (1903), and of various monographs in mathematical journals. In 1903 he became president of the American Mathematical Society and was associate editor of its publications (1905–10).

VAN WERT, van wert, Ohio, city, county-seat of Van Wert County, on the Pennsylvania and the Cincinnati, Jackson and Mackinaw railroads, about 100 miles, in direct line, northwest of Columbus and 75 miles southwest of Toledo. It was incorporated in 1848 as a town and obtained a city charter in 1903. It is in an agricultural and stock-raising region. There are about 100 factories and mills, including flour and grist-mills, bent-wood and stave factories, oil-well supply works, etc. There are two daily newspapers and two banks. Pop. 8,200.

VAN WYCK, Charles Henry, American legislator: b. Poughkeepsie, N. Y., 10 May 1824; d. Washington, D. C., 24 Oct. 1895. He was graduated from Rutgers in 1843, engaged in law practice, in 1850–56 was district attorney of Sullivan County, N. Y., and in 1859–63 was a member of Congress. While still holding his seat in Congress he volunteered in the Union army, served under General McClellan in the Peninsular campaign and in 1865 was brevetted brigadier-general of volunteers. He sat again in Congress in 1867–71, and in 1874 removed to Nebraska, where he was a member of the State Constitutional Convention in 1876, State senator in 1876–80 and in 1881 became United States senator.

VAN ZILE, Edward Sims, American novelist: b. Troy, N. Y., 2 May 1863. He was graduated from Trinity College, Hartford, 1884, and from 1884–86 was editorial writer on the Troy *Times* and on the New York *World* from 1886–90. He was for a time manager of the Literary Bureau of the United Press and editor of *Current Literature,* and he has published 'Wanted — A Sensation' (1886); 'The Last of the Van Slacks' (1889); 'A Magnetic Man' (1890); 'The Manhattaners' (1895); 'Kings in Adversity' (1897); 'Perkins the Fakeer' (1905); 'Into the Sunset' (1914); 'The Game of Empires' (1915).

VAN ZORN. This comedy of New York artist life (1914), is one of two published plays by Edwin Arlington Robinson, the other being a tragedy of modern New England, called 'The Porcupine,' published at about the same time and just before the volume of poems called 'The Man Against the Sky.' Although 'Van Zorn' has had no public performances except a series given in a hall in Brooklyn by a semi-professional company in 1917, it is not, like so many poets' plays, a chamber-drama. It is distinctly a play for the theatre, a play of ideas such as would have found a ready welcome all over the continent. It is one of a limited number of good acting plays, which are literary as well, written by Americans. 'Van Zorn' is a comedy of character, the story of a fatalist who, in an attempt to play the part of destiny in a love-affair, runs counter to a man with a destiny better than his own. The theme and the treatment are both unusual, the dialogue is brilliant and the characters, especially the men, are not theatrical types but thoroughly real people. Anyone familiar with Mr. Robinson's poetry would recognize in 'Van Zorn' the author of 'Richard Cory' and 'Flammonde,' his philosophy and his technique — especially his bold elisions — but no more disturbingly than he would recognize the dramatist in 'Merlin' or 'Ben Jonson Entertains a Man From Stratford.' 'Van Zorn' may be classed among important American plays even if it remains a play without a stage history.

EDITH J. R. ISAACS.

VANADINITE, a mineral of considerable importance as an ore of the rare element vanadium. It is a chloride and vanadate of lead, $Pb_5V_3O_{12}Cl$. Vanadinite is a member of the apatite group and its crystals are, therefore, hexagonal with pyramidal hemihedrism. The prismatic crystals are sharp and smooth, or, more frequently, cavernous; sometimes they are clustered in parallel groups similar to the isomorphous mineral pyromorphite. Vanadinite has a hardness of about 3 and a specific gravity varying from 6.66 to 7.23. Its lustre is resinous to adamantine. The finest specimens (from Yuma County, Ariz.) are occasionally transparent, but usually the mineral is nearly or quite opaque. The color is very variable; rich scarlet and other shades of red graduate through dark to very pale yellow, while more rarely the mineral is brown or gray. The variety endlichite, which contains from 11 to 13 per cent of arsenic, is regarded as an isomorphous mixture of vanadinite with the lead chloro-arsenate, mimetite. It occurs in magnificent specimens in New Mexico. Other important localities of vanadinite are at Wanlockhead in Scotland, where it occurs in small, globular, crystalline mases, in Carinthia and Argentina.

VANADIUM. A rare element which, in its chemical behavior, is related to arsenic, phosphorus and nitrogen. Its symbol is V, its atomic weight 51.2 and its specific gravity 5.5. It was discovered by Seffstrom in 1830 and derives its name from the Scandinavian goddess Vanadis, who corresponds to Freya in the Teutonic mythology. It is never found free in nature but exists in combination, in small quantities, in copper, lead and iron ores, particularly the latter. It is contained in *vanadinite* $(PbCl)Pb_4(VO_4)_3$, and *decloisite* $(PbTn)_2(ON)VO_4$ and is extracted with great difficulty. It is widely diffused in nature, being found where deposits of copper, lead and iron are found. In the United States it has been ob-

tained from the mineral deposits of Colorado, Utah and elsewhere. It may be reduced to a free state by heating vanadium dichloride in a stream of hydrogen and appears in the form of a silver colored crystalline powder. This powder is acted upon very slowly by the air at ordinary or even elevated temperatures. but it burns brightly and produces V_2O_3 when ignited. It is soluble in nitric, hydrofluoric and concentrated sulphuric acids, but not in hydrochloric or dilute sulphuric acids. Vanadium forms three basic oxides V_2O, V_2O_3 and V_2O_3, and two acid oxides V_2O_4 and V_2O_5. The last of these is very important and appears as a reddish yellow powder, which dissolves freely in alkaline hydroxides or carbonates and forms salts which are known as vanadates. Three varieties of vanadates have thus far been composed and they are known as ortho, pyro and metavanadates, the latter being the most stable of the three. The metavanadate of sodium is a salt of considerable importance. The vanadates carry oxygen in many chemical reactions. Vanadic acid is the most important and the best known of the compounds of vanadium. It is the final product of the oxidation of vanadium and bears to that element the same relation which phosphoric arsenic and antimonic acids bear to their respective metals. Vanadic acid parts readily with its oxygen and receives it again as readily frcm other substances. Thus when vanadic acid is taken into the blood it is first converted into hypovanadic acid, but when it is subsequently combined with the oxyhæmoglobin of the blood it is raised to hypervanadic acid. Metovanadic acid may exist in free condition in the form of a beautiful golden yellow substance which is sometimes used as a substitute for gold bronze. Ammonium metavanadate is used in the manufacture of the dye which is known as aniline black and also in the manufacture of vanadium ink. Thus while vanadium itself is a metal of no particular importance technically, its various combinations have a very decided value from many points of view. In addition to the uses which were mentioned in the preceding paragraphs it is important to note the following: the pentoxide of vanadium is useful in photography as a developer, the chloride and the trioxide are used as mordants in the manufacture of print cloths, the trioxide is also employed in the manufacture of steel and in the composition of malleable and ductile alloys.

Vanadium has also been used to a moderate extent as a therapeutic agent, the pentoxide (hypervanadic acid) being given in diseases which are due to defective metabolism, but it is a substance in the use of which there may be decided danger and there does not seem to have been enough clinical evidence thus far to justify its frequent use. It is not mentioned in the list of approved medicinal substances which is to be found in the last edition of the United States pharmacopœia. There are those, however, who advocate its use therapeutically among whom may be mentioned Laran, Lyonnet, Martz, Martin, Helouis and Delarne. The physiological action of vanadium salts has been investigated by Platt (*Lancet*, 15 Jan. 1876), by Gamgee and Larmuth (*Journal of Anatomy* II, 2, 1879) and by Priestley and Gamgee ('Philosophical Transactions,' Vol. 166, p. 12). Kobert and others ('Lehrbuch der Intoxikationen,' p. 309, 1893) have written in regard to its therapeutic action. Weber ('Revue de clinique et de thirapic,' 1898) and Helouis and Delarne ('Congris pour l'étude de tuberculose,' p. 895, 1898, des comptes rendus et mémoires') have described its effect upon sick animals, especially upon horses, to which it was administered successfully in an epidemic in which the noteworthy symptoms were great emaciation and exhaustion.

The most extended investigations to determine the therapeutic value of vanadium were made by Laran ('Lyon Mèdical' xc, 1899). His experiments upon animals were made with guinea pigs, frogs, rabbits and dogs and he used a 5 per cent watery solution of metavanadate of soda with a sufficient quantity of physiological salt solution added. The conclusions at which he arrived after a very exhaustive consideration of the subject were as follows:

1 Vanadium compounds oxidize very readily and hence are of great value in the industrial arts.

2 Metavanadate of soda is very poisonous.

3 This salt has very little effect, in vitro, upon the digestive fluids, blood sugar, yeast and microbes.

4 In spite of its toxicity it can be given to human beings, by mouth, in doses of one to five milligrams, during the 24 hours. It is desirable to intermit its administration for two or three days during the week. It is a tasteless substance, but is easily tolerated when it is given in the manner which was indicated above.

5 It almost always increases the appetite, the strength and the weight.

6 The urine is slightly increased by its use, there is also an increase in the urea and in the coefficient of nitrogen oxidation. In diabetes it will lessen the formation, but only temporarily.

7 It stimulates the process of internal combustion and causes constant change in the blood by oxidation, the formation of vanadic acid being followed by that of hypovanadin, the latter being, therefore, an acid bearer to the tissues.

8 Metavanadate of soda has a certain value as a therapeutic agent, its action being similar to that of arsenic.

It could, therefore, be properly recommended to those who are suffering with poor nutrition or with various constitutional troubles, including tuberculosis, chlorosis, rheumatism, softening of the arteries and enlargement of the veins.

Poisonous effects may be produced by its absorption when used medicinally, when taken accidentally or when exposed to its vapors, the latter occurring frequently to those who are workers in vanadium. The lesions which result from poisoning with vanadium are to be found chiefly in the lungs, the kidneys and the gastro-intestinal tract.

Those whose employment constantly exposes them to the influence of vanadium are frequent sufferers with tuberculosis in a form which dispose them to the occurrence of severe or even fatal hæmorrhage. Such workers also suffer constantly with irritation of the nose, throat and eyes. See MINERAL PRODUCTION OF THE UNITED STATES.

VANBRUGH, vän-broo', SIR **John**, English architect and dramatist: b. London, 1664;

d. 26 March 1726. He was educated in England and in France, entered the English army in 1686 and from 1690 till 1692 was a prisoner in France, being latterly confined in the Bastile. He acquired his knowledge of architecture during his residence in France. His first play, 'The Relapse or Virtue in Danger' was brought out at Drury Lane in 1697. 'Æsop,' founded on a French original, followed at a short interval and in May of the same year his play of 'The Provok'd Wife' was performed. In 1700 he adapted Beaumont and Fletcher's comedy of 'The Pilgrim.' In 1702 he designed Castle Howard, the seat of the Earl of Carlisle, and produced 'The False Friend' and later 'The Provoked Husband.' He now entered into a speculation to build a great theatre at the west end of London, in which he was his own architect. Both plays and operas were produced; but it did not prove a success. He wrote for it the 'Confederacy' and became charged with the erection of Blenheim Palace for the Duke of Marlborough. This work got him into considerable pecuniary trouble, as the money supplies, provided out of the civil list, were latterly stopped and heavy claims were made against him. Ultimately the duchess took the work out of his hands and he had difficulty in getting the money that was justly due. He built many other mansions for the nobility, for which he must have received considerable sums. From 1702 to 1711 he was comptroller of the board of works. In 1714 he was knighted by George I, in the following year appointed comptroller of the royal works and in 1716 architect of Greenwich Hospital. Vanbrugh's plays are admirable in dramatic conception as well as in wit, but are stained with the coarse profligacy of his day. His architectural works have been praised by many but they can only be looked upon nowadays as the most pronounced examples of the heavy English Baroco style. Consult Ward, 'Sir John Vanbrugh' (1898); Dametzi, 'John Vanbrugh's Leben und Werke' (1898).

VANCE, vāns, **Louis Joseph,** American magazine contributor and novelist: b. Washington, D. C., 1879. He was educated at the Polytechnic Institute in Brooklyn, N. Y., and in 1900 began writing descriptive stories and poems for the magazines. His work sprung into prompt popularity and in 1907 he published a novel, 'The Brass Bowl,' which established his reputation. He has also written 'The Bronze Bell' (1908); 'The Black Bag' (1909); 'The Fortune Hunter' (1910); 'The Bandbox' (1912); 'Joan Thursday' (1913); 'The Lone Wolf' (1914); 'Sheep's Clothing' (1915); 'Nobody' (1915); 'The False Faces' (1917).

VANCE, Zebulon Baird, American politician: b. Buncombe County, N. C., 13 May 1830; d. Washington, D. C., 14 April 1894. After obtaining an education at Washington College, Tenn., and the University of North Carolina, studying law and being admitted to the bar in 1853, he established himself in practice in Asheville, N C. The next year (1854) he was sent to the State legislature and in 1858 was elected to Congress to fill the vacancy caused by the resignation of Representative Clingman. He was opposed to secession, but at the opening of the Civil War adopted the Confederate cause and became colonel of the 26th North Carolina regiment. He was elected governor in 1862 and re-elected in 1864 and in 1870 was elected to the United States Senate, but not being allowed to take his seat there on account of his political disabilities not having been removed, he resigned in 1872. In 1876 he again became governor, and being elected to the United States Senate in 1879 retained his seat until his death. Consult Dowd, 'Life of Zebulon B. Vance' (1897).

VANCOUVER, George, English navigator: b. 1758; d. Petersham, Surrey, 10 May 1798. He was appointed to the *Resolution* by Capt. James Cook in the autumn of 1771 and on his return from a voyage around the world (1772–74) assisted in the equipment of the *Discovery* and as midshipman accompanied Cook on his last voyage to the North Pole, which was concluded in October 1780. During the following decade he was promoted and 1 Jan. 1790 he was appointed to the *Discovery,* built for exploration in the South Sea, but the Nootka Sound dispute caused the abandonment of the project and Vancouver was placed in command of the *Courageux,* one of the "Spanish armament." On 15 Dec. 1790 he was promoted to commander and assigned to the *Discovery.* It was then decided to dispatch an officer to Nootka Sound "to receive back in form the territory which the Spaniards had seized," also to make an accurate survey of the coast northward from the 30th degree and to ascertain if there were a northwest passage. He sailed in the *Discovery* 1 April 1791, touched at the Cape of Good Hope and surveyed the coasts of New Zealand and Australia, discovering and naming King George's Sound, Mount Gardner, Cape Hood and other points. He then went north and received the formal surrender of Nootka and spent the three summers of 1792–94 in surveying the American coast as far north as Cook's Inlet, wintering at the Sandwich Islands. On his return voyage he visited the chief Spanish settlements on the west coast of South America and reached England in 1795. On 28 Aug. 1794 he was raised to the rank of post captain. Consult Newcombe, C. F., 'First Circumnavigation of Vancouver Island' (Victoria 1914).

VANCOUVER, Canada, the largest city and chief seaport of British Columbia, the fourth city of Canada in population, is situated on the Gulf of Georgia opposite Vancouver Island on the northern Pacific Ocean. Its chief harbor front is on Burrard Inlet, a spacious sheet of water, entered by a passage between Stanley Park and North Vancouver, and extending some 20 miles into the interior. Other water fronts are English Bay, from which ships may enter another arm of the sea called False Creek, on which are shipyards and other industrial establishments. Vancouver is the western terminus of the Canadian Pacific Railway, and of the government transcontinental system known as the Canadian Northern. It is also one of the Pacific terminals of two United States railways, the Great Northern and the Northern Pacific.

History.— The history of Vancouver as a city begins with 1885, when the Canadian Pacific Railway Company established its terminus there. Before that time the site was covered with forest of the type now seen in the adjoining Stanley Park. The first important industry established at Vancouver was the Hastings lumber

mills, a large plant on the harbor front whose furnace fires have not been extinguished in a third of a century. On 13 June 1886 the young city, which had been incorporated four months before, was entirely swept away by fire, but it was quickly rebuilt, and, except for brief intermissions which mark the advance of all new cities, its growth in population, commerce, industry and wealth has been rapid and continuous.

Commerce and Industry.— The trade of Vancouver has steadily increased. Exports in the fiscal year 1912 were $8,000,000. In 1916 they had increased to $15,000,000. In 1917, $29,000,000; in 1918, $31,000,000; in 1919, $37,000,000. Imports from 1916–19 were $20,000,000, $29,000,000, $41,000,000 and $47,000,000. There is a large provincial coastwise trade not included in these returns.

In the year ending March 1919, 1,332 seagoing vessels of 1,760,000 tons and 9,880 coasting vessels of 3,400,000 tons entered the Port of Vancouver. Regular steamship services include Canadian Pacific lines to China, Japan and Manila, the Blue Funnel line to the same countries, a line to Australian and New Zealand ports and to Honolulu, two lines to Shanghai, Hongkong and other Chinese ports; a Japanese line between Vancouver and various Asiatic ports, several lines connecting Vancouver by way of the Panama Canal with British and Mediterranean ports, South Africa, New York and ports in Eastern Canada and the West Indies. Between Vancouver, Victoria and Seattle there are double daily services by one line and daily services by others, while there are regular sailings between Vancouver and many points north and south on the mainland and on Vancouver Island. Halibut fleets and other fishing vessels operate from the port and tramp steamers from all countries may be seen in the harbor.

Among the leading industries are lumber and woodworking establishments, shipbuilding in steel and wood, sugar refining, engineering and machine works, shoe factories, assaying and metal refining, meat, fish and fruit packing, furniture factories and all the local industries which belong to a seaport and distributing centre. The Canadian Pacific Railway has an extensive system of wharves with over 600,000 square feet of area and 350,000 square feet of sheds. The Dominion government has a large wharf with sheds and grain elevators and is now undertaking a large program of wharf construction and the establishment of a drydock. There are numerous private wharves and warehouses. The harbor is administered by a commission appointed by the Federal government. Customs duties collected at the port in 1919 were $8,740,000, inland revenue $588,000, postal revenue $727,000, bank clearings for the year $577,000.000.

Public Utilities.— Transportation within the city, in the suburbs and up the Fraser River some 60 miles is handled by the British Columbia Electric Railway, which company also supplies electric light and power from its waterworks at Lake Buntzen. Power is also obtained from the Western Power Company, with works at Stave Lake, and there are almost unlimited natural sources of water power available for further production. The water supply for the city and the surrounding municipalities is taken from the Capilano River, which flows from a neighboring mountain. Pipes are laid to reservoirs high above any present or possible settlement so that the water is always pure and cold.

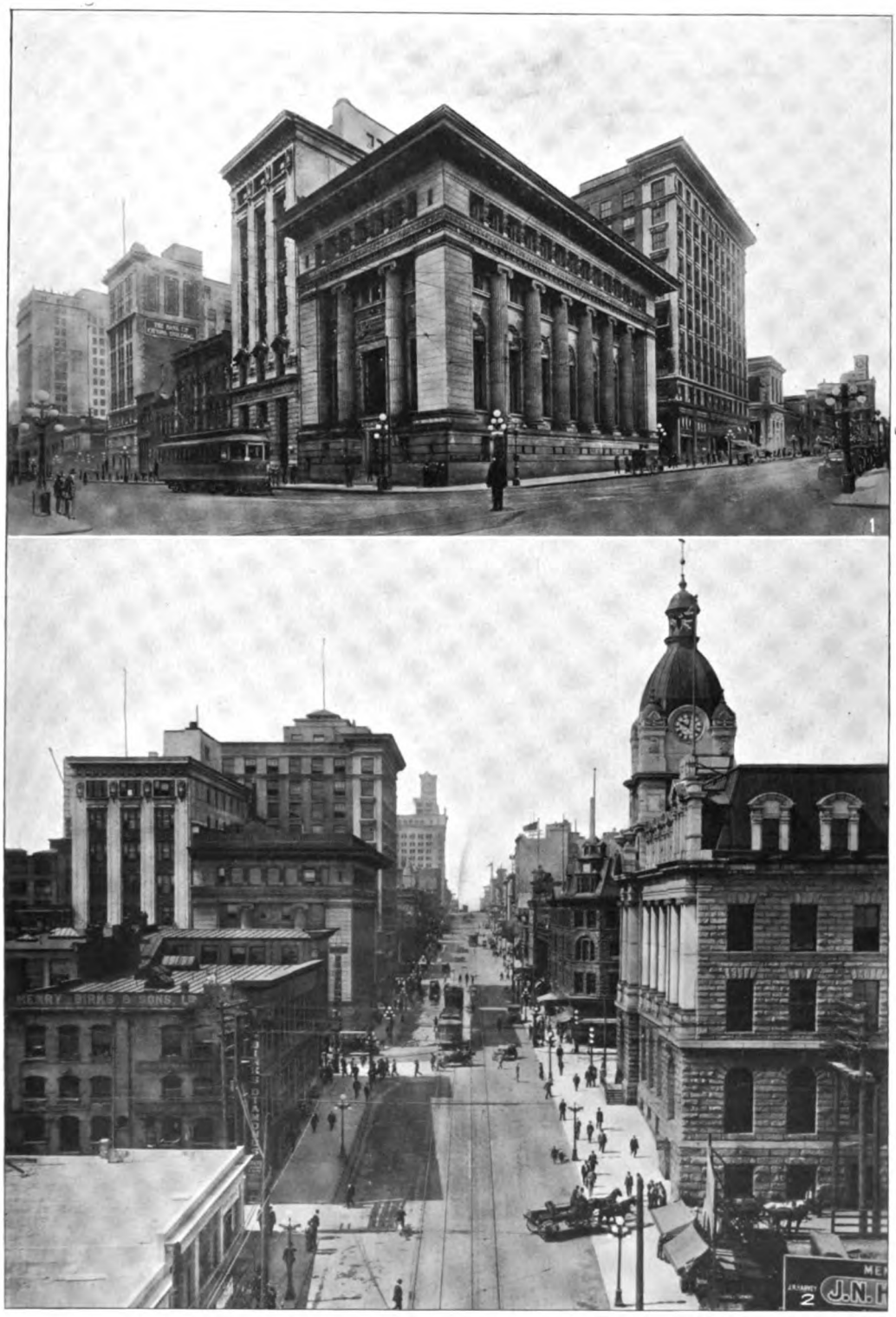
Public Buildings.— While Vancouver does not boast many splendid public buildings, some of these are in keeping with the growth and ambitions of the city. The Canadian Pacific Railway station, rebuilt in 1917–18, is a large and attractive building. The Government Railway depot, opened for traffic in November 1919, is a fine structure costing over a million dollars, and near it is the station of the Great Northern which cost $500,000. These two buildings and the railway yards are situated on land several hundred acres in extent reclaimed from the tide flats of False Creek, part of which area is reserved for commercial and industrial establishments and part for gardens and open ground.

The Hotel Vancouver, which was greatly enlarged and remodeled in 1917–18, is said to be the largest hotel in Canada. The General Public Hospital is the largest in the dominion and accommodates the greatest number of patients. All the larger Canadian banks are represented in Vancouver and three or four of them have erected spacious office buildings. The courthouse, built about 1910 at the cost of $1,000,000, is perhaps the finest public building in the city. There are several large churches, but none that are conspicuous for their architectural beauty.

Education.— The University of British Columbia, now occupying temporary quarters within the city limits, is to have its permanent home some six miles out at Point Grey, on a headland overlooking the sea in two directions and commanding a remarkable view of the city and of the coast and mountains. On this site of over 500 acres some of the buildings are partly erected. University classes were opened in 1915 with 379 students. The attendance of undergraduates in 1919 was 890 with several hundred returned soldiers and others taking partial or vocational courses. The staff of instruction numbers 70, with faculties in arts, applied science and agriculture and a department of nursing, established in 1919. It is the policy of the province not to give degree-conferring powers to any other institution nor to encourage the foundation of competing schools. The University is supported by annual votes of money and is administered by a board of governors appointed by the provincial government and by a senate largely elected by a convocation of university graduates. Vancouver has a good equipment of public schools and high schools and in 1919 was taking special interest in the establishment of technical institutions. The public school population in 1919 was 17,000.

Government.— The city is administered by a mayor and council of eight aldermen elected by wards. For several years after 1910 its revenues were nearly all provided by taxes on real estate with improvements exempt. Vancouver has been cited by single-tax advocates as an example to be imitated. But after the phenomenal advance in real estate values came to an end and more stable conditions arrived, the policy was modified, and at the time of writing improvements are taxed on half their value. Vancouver is represented in the Canadian House of Commons by two members, elected by separate districts, and in the provincial legis-

VANCOUVER



1 Business District, Vancouver, Canada. Corner of Granville and Hastings Streets, showing the Bank of Commerce on the corner

2 Business Street, Vancouver, Canada. Looking up Granville Street, showing the Post Office on the right

VANCOUVER

1 View of Marine Drive, Vancouver, Canada. Parking place at Point Grey from which is viewed English Bay and the Straits of Georgia. Islands of Howe Sound in foreground and Vancouver Island in the distance

2 Driveway in Stanley Park. This motor road encircles the park and is nine miles in length. This park is situated within a 15 minutes' walk from the centre of the city

lature by six, who are elected by the citizens at large.

Parks, Recreation Centres, etc.—The pride and boast of Vancouver is Stanley Park, a forest of 900 acres with a few small clearings, one of which is an athletic field and another is occupied by a garden and zoo. The park is kept as nearly as possible in a state of nature except that walks and drives have been provided. This wood is on a point extending into the bay and a seven-mile drive around follows the curves of the shore. There are trunks of trees 30 to 40 feet in circumference in this park, and one of the paths leads by a close cluster of 10 or a dozen trees from 7 to 10 feet in diameter. Vancouver is noted among other things for its bathing beaches, of which there are three or four within the city limits under the administration of a park commission. Every afternoon in summer these are thronged with thousands of children and adult bathers.

The city is the seat of an Anglican bishop and a Roman Catholic archbishop.

Population.—The population in 1891 was 13,709; in 1901, 27,010; in 1911, 100,401. It is now considerably larger, though the growth may not have been in the present decade so rapid as in the last. These figures relate to the incorporated city alone. Meanwhile there has been a considerable overflow into new municipalities included in "Greater Vancouver." The most fashionable residential district, called Shaughnessy Heights, though nearer the heart of the city than some of the wards, is part of the Corporation of Point Grey. There is only a street between the city and South Vancouver, which had in 1911 a population of 16,126. Across Burrard Inlet is North Vancouver with a population in 1911 of 8,196. It is expected that some, or all of the municipalities will before long be incorporated with Vancouver into one city. About 70 per cent of the population is of British origin. In 1911 there were 3,480 Chinese, 373 Hindus and 1,992 Japanese, but since then the Oriental population has increased.

S. DUNN SCOTT,
Staff of the Vancouver Daily Province.

VANCOUVER, Wash., city, county-seat of Clarke County on the Columbia River and on the Vancouver, K. and Y., and the Northern Pacific railroads, about eight miles north of Portland, Ore. It has steamer connection with the Columbia River ports and with a number of the Pacific ports. It was founded in 1828 by the Hudson's Bay Company and in 1858 was incorporated. It is in a region noted for its extensive lumber interests. There are many good farms nearby and considerable attention is given to raising livestock. The chief manufacturing establishments are lumber mills, flour mills, breweries, brick works and machine shops. The United States Military Department of the Columbia has its headquarters here and the Vancouver Barracks, established in 1849, is one of the best army posts in the country. In the centre of the city is a pretty park and the principal public buildings are the county courthouse, the House of Providence, a hospital, and the schools. The educational institutions are a public high school, founded in 1889, a private high school, Providence Academy (Roman Catholic), Saint James College, public and parish elementary schools, a public library and two school libraries. A United States Land Office is here and a regular army garrison. The government is administered under a charter of 1890 which provides for a mayor, who holds office one year, and a city council. It has one daily and two weekly newspapers and good banking facilities. Pop. 11,930.

VANCOUVER BARRACKS, military post in the State of Washington, eight miles from Portland, Ore., established in 1848. The reservation includes 640 acres and is on the right-hand bank of the Columbia River.

VANCOUVER ISLAND, Canada, an island on the west coast, in the Pacific Ocean, opposite and at no great distance from the west shore of British Columbia, of which province it forms part; length, 285 miles; breadth, from 40 to 80 miles; area, about 20,000 square miles. It has no navigable rivers, but several deep arms of the sea project far inland, forming good harbors. One of the chief of these is Nootka Sound, an inlet on the west coast discovered by Captain Cook in 1778. The sound extends in a northeast direction about 10 miles inland, but in no part is it more than 500 yards broad; it embraces several islands, the largest being called Nootka, famous for the Nootka Convention of 28 Oct. 1790 which averted war between Spain and Great Britain, consequent on a Spanish seizure of British vessels at Nootka the year previously. A granite monument on a rocky islet facing the entrance to Friendly Cove, erected in 1903 by the Washington University State Historical Society, commemorates the meeting of Quadra and Vancouver, the Spanish and British commissioners whose joint names Vancouver Island bore as a title for half a century. A mountain chain traverses Vancouver Island from southeast to northwest at an average height of between 2,000 and 3,000 feet, the highest point being Victoria Peak, 7,484 feet in the northern half of the island. Coal is worked at Nanaimo and gold, copper and iron ore and other valuable minerals are found. Forests are numerous and the timber trade is important. Horses, cattle, sheep and pigs thrive well. The puma, the bear, the wolf, two kinds of deer, the marten and other fur-bearing animals exist in the less settled parts of the island; partridges, snipes and many varieties of wildfowl are found. The seas and lakes abound with fish. The climate is damp and cold. The harbor of Esquimalt (q.v.), on the southeast coast of the island, is one of the finest in the continent and is the chief Pacific station of the British fleet. Victoria (a city of 60,000) is the chief town and the capital of British Columbia. A railway connects Victoria with Esquimalt and the great coal-shipping port of Nanaimo, opposite Vancouver (q.v.), which is on the mainland. Pop. about 60,000, including some 10,000 Wakash Indians.

VANDAL, vän-däl, **Louis Jules Albert,** French historian: b. Paris, 7 July 1853. He was educated at Paris, and appointed to a professorship in the Ecole des Sciences Politiques. His first literary work was a book of travel, 'En Karriole à travers la Suède et la Norvège). He has devoted himself mainly to writing diplomatic history, making an exhaustive study of state documents. His works in this field are distinguished for elegance of literary form as well as for accuracy in detail and a scholarly

grasp of his subject. They include 'Louis XV et Elizabeth de Russie' (1882); 'Ambassade française en Orient sous Louis XV' (1887); 'Napoléon et Alexandre I' (1891–93); 'L'Odysée d'un Ambassadeur'; he has also dealt with the internal history of France in his 'Le 18. Brumaire' and 'La conquête de Paris par Bonaparte.' In 1897 he was elected a member of the French Academy to succeed Leon Say.

VANDALIA, văn-dā'lĭ-ą, Ill., city, county-seat of Fayette County, on the Kaskaskia River, and on the Illinois Central and the Terre Haute and Illinois railroads, about 60 miles northeast of Saint Louis, Mo. It was settled in 1816, and was the capital of the State from 1818 to 1836. The city is in a fertile agricultural region in which considerable attention is given to stock-raising. The chief industrial establishments are a paper mill, foundry, tarring plant, wagon factory, manufactory of butchers' blocks, brick works, stave factory and machine shops. The principal buildings are the old capitol, the county courthouse and several business blocks. The educational institutions are a high school, public graded schools and a public library. The government is vested in a mayor and common council. The city owns and operates the water-works. There are three newspapers and excellent banking facilities. Pop. 3,086.

VANDALS, văn'dąlz, a German nation or confederation, probably allied to the Goths, who occupied at an early period the country of North East Germany on the south of the Baltic, between the Oder and the Vistula. At a later period they appear to have descended into Silesia, and occupied the country about the Riesen Mountains. In the Marcomannian War they attacked Pannonia in conjunction with the Marcomanni and the Quadi. In the reign of Constantine they had migrated or spread themselves into Moravia, whence they were transplanted to Pannonia, from which they migrated again, taking an eastward direction, into Dacia. In 406 they joined a confederate German host which crossed the Rhine into Gaul, and from thence, after Gaul had been ravaged, the Vandals found their way into Spain, in which they established themselves under their chief Godigiselus. In Galicia they contended with success with another barbaric horde of invaders belonging to the Suevi, and having vanquished a confederate army of Goths and Romans, they advanced still farther, and seized and ravaged Seville and Carthagena. Under Genseric, who had newly assumed the leadership, they crossed to Africa. In 429 they vanquished the Roman governor and established a kingdom, which spread over the greater part of the Roman possessions on that continent. Genseric immediately began to revive the maritime glories of Carthage, diligently cultivating the means of maritime warfare and extending his conquests to Sicily, Sardinia and Corsica. He also invaded Italy and sacked Rome in 455. The atrocities of the Vandals on this occasion have been a favorite subject of declamation, but Gibbon shows them to have been much exaggerated. Genseric concluded a long reign in peace in 477. The kingdom of the Vandals was continued under his descendants — Hunneric, his son, who immediately succeeded him; Gundamund, 484; Thrasimund, 496; Hilderic, 523; Gelimer, 530. It was overthrown in 534 by Belisarius, the general of the eastern Emperor Justinian. The Vandals adopted the Arian faith, and persecuted the orthodox Christians. Consult Gibbon, 'Decline and Fall of the Roman Empire'; Schmidt, 'Älteste Geschichte der Vandalen'; Procopius, 'History of his own Time.' See HUNS.

VANDAM, Albert Dresden, English journalist: b. London, March 1843. He was educated in Paris, and during the Franco-German War was correspondent for several American journals. After living in London (1871–82) engaged in literary work, he became the Paris correspondent of the London *Globe* in 1882. He returned in 1887 to London, where he has since resided. He is the author of 'Amours of Great Men' (1878); 'An Englishman in Paris' (1892); 'My Paris Note Book' (1894); 'French Men and French Manners' (1895); 'Undercurrents of the Second Empire' (1896); 'A Court Tragedy' (1900), etc.

VANDENHOFF, văn'dĕn-hŏf, **George,** American actor: b. England, 18 Feb. 1820. He made his first appearance on the stage in England in 1839, came to the United States in 1842, and continued on the stage with great success, but in 1856 he retired, studied law, and was admitted to the bar in 1858. He afterward engaged in giving readings and as a teacher of elocution. He published 'The Art of Elocution' (1846); 'Leaves from an Actor's Note-Book' (1860); 'Rules for Reading Aloud' (1862), etc.

VANDER VEER, Albert, American surgeon: b. Root, N. Y., 10 July 1841. He studied medicine in the Albany Medical College, and in the Medical Department of Washington University, where he took his degree (1862). His honorary degree came from the Albany Medical College in 1869. He was surgeon in the 66th New York Volunteers in the Civil War, and he was connected with the teaching force of the Albany Medical College from 1869 to 1905. He was surgeon in chief of the Albany Hospital, consulting surgeon at Saint Peter's Hospital; was elected regent of the University of the State of New York (1895) and became vice-chancellor (1915). He is the author of numerous professional papers dealing especially with abdominal and uterine surgery.

VANDERBILT, văn'dĕr-bĭlt, **Cornelius,** American capitalist: b. near Stapleton, Staten Island, N. Y., 27 May 1794; d. New York, 4 Jan. 1877. He was the son of a farmer, received but little school education, and at 16 purchased a ferryboat with which he carried passengers and farm products between Staten Island and New York. Two years later he had control of three boats, and his ferry was well established. It was not long before he was extensively engaged in transportation enterprises, and he came to be popularly called "Commodore." Marrying in 1813, he removed his residence to New York. In addition to his river and harbor boats, in 1817 he built a steamer to run between New York and New Brunswick, N. J., himself acting as captain. In 1827 he leased a ferry running to Elizabeth, N. J., and afterward held interests in steamboat lines on the Hudson and on Long Island Sound. In 1851 he established a fast line to California, passengers being transferred across the Isthmus of Nicaragua. This enterprise

was said to have returned him $10,000,000. During the Crimean War, when English shipping forsook the seas, he established a steamship line between New York and Havre, France. A little later he began to transfer his capital from water traffic, and entered upon a career of railroad financiering and management, buying in 1863 a great part of the New York and Harlem Railroad, afterward obtaining control of the Hudson River Railroad and of the New York Central, becoming president of the last-named in 1867. All these lines he managed with great ability, securing marked improvement in their organization and service. Having in 1869 consolidated the line of the New York Central and the Hudson River roads, he extended his system to Chicago by obtaining interests in the Lake Shore, the Canada Southern and the Michigan Central lines. During the Civil War he presented the steamship *Vanderbilt* to the United States government, and for this patriotic act received a gold medal from Congress. Among his public benefactions the most noteworthy was his contribution of $1,000,000 for the founding of Vanderbilt University (q.v.). His fortune was estimated at about $100,000,000, the bulk of which he left to his son, William H. Vanderbilt.

VANDERBILT, Cornelius, American financier: b. New Dorp, N. Y., 27 Nov. 1843; d. 12 Sept. 1899. He was privately educated; entered a broker's office, and later became treasurer of the Harlem Railroad. He became first vice-president of the New York Central and Hudson River Railroad (1877) when his father assumed control, and was elected president of the Canadian Southern (1883) when his father retired, and chairman of the board of directors of the New York Central, and of the Michigan Central roads. He gave large sums to the educational and religious institutions of his time including the Cathedral of Saint John The Divine. He left a fortune estimated at $70,000,000.

VANDERBILT, George Washington, American capitalist: b. New Dorp, Staten Island, N. Y., 14 Nov. 1862; d. Washington, D. C., 6 March 1914. He was widely known for his establishment near Asheville, N. C., of a vast private park of 100,000 acres known as Biltmore, on which he erected a magnificent mansion designed by Richard Morris Hunt (q.v.). He built and presented to New York the 13th street branch of the Free Circulating Library, and gave the New York Teachers' College its site on Morningside Heights.

VANDERBILT, William Henry, American capitalist: b. New Brunswick, N. J., 8 May 1821; d. New York City, 8 Dec. 1885. He was educated in the grammar school of Columbia College; in 1838 he engaged in business, but in 1842 failing health caused his retirement to a farm at New Dorp, N. Y. Later he was appointed receiver and became president of the Staten Island Railroad, and (1877) on his father's death, president of the New York Central Railroad. He resigned (4 May 1883) his office as president of the Vanderbilt system, and his two sons were educated to succeed him. He gave much money to educational institutions in his lifetime, and in 1881 presented $103,000 for the removal of the obelisk from Alexandria, Egypt, to Central Park, New York.

VANDERBILT UNIVERSITY, a coeducational institution of higher learning, located at Nashville, Tenn., founded by Cornelius Vanderbilt of New York, who in 1873 made a donation of $500,000 which was afterward increased to $1,000,000. The charter of the university was taken out in 1872 in the name of Central University. In 1873 the name was changed to Vanderbilt University. Work began in 1875 with four departments, law, medicine, theology and arts. In 1879 the departments of dentistry and pharmacy were added, and in 1886 the department of engineering. These seven departments indicate the present organization of the university. The continued growth of the university has been made possible by gifts of various members of the Vanderbilt family, especially by William H. Vanderbilt, son of the founder, and by Cornelius Vanderbilt, F. W. Vanderbilt and William K. Vanderbilt, all grandsons of the founder. A large number of gifts have also been made by others, the most notable of which was a gift of $1,000,000 to the School of Medicine, made by Andrew Carnegie in 1913. At present the productive funds of the university amount to $3,600,000. Other property amounts to $1,450,000. The annual income is $300,000. The number of students (1919), 1,000. The main campus of the university is situated in the West End portion of Nashville, and comprises a tract of 75 acres, justly celebrated as one of the most beautiful college sites in the world. Here the work of all departments is done except medicine and dentistry. These are located on a special campus of 14 acres in the southern part of the city, near the City Hospital. The College of Arts and Science has maintained from the beginning a high standard for admission and graduation, and has exercised an unusual influence on education in the South. The work of the freshman year is required. After that, all work is elective, but students are required to arrange their courses around some central group of studies. The degree of B.A. is given for all courses, although B.S. may be given for specialization in the natural sciences. The university is coeducational, but no special effort has been made to increase the attendance of women. It is, therefore, known chiefly as a college for men.

Vanderbilt University has 3,250 names on its register of those who served in the Great War. Worthy of special mention is the hospital unit which rendered efficient service in France. Vanderbilt University was originally affiliated with the Methodist Episcopal Church, South. An effort to bring it entirely under the control of the church was resisted by the trustees, whose position was sustained by a decision of the Supreme Court of the State of Tennessee in 1914. Since then the university has considered itself independent and undenominational.

Bishop H. N. McTyeire was the first president of the Board of Trust, and in that capacity the chief executive officer of the university until his death in 1889. After his death the chancellor succeeded to most of his duties and responsibilities. The first chancellor was Dr. Landon C. Garland, who was succeeded in 1893 by J. H. Kirkland, who had previously held the professorship of Latin.

VANDERGRIFT, văn-dĕr'grĭft, Pa., borough in Westmoreland County, on the Kiskiminetas River, and on the western Pennsylvania division of the Pennsylvania Railroad, 25 miles east of Pittsburgh. It is situated in a beautiful valley and is noted for its manufacture of sheet steel, the Apollo Iron and Steel Company, now absorbed by the United States Steel Corporation, being situated here, and is one of the largest steel plants in the world, having eight open hearth furnaces, a gigantic continuous bar mill, 29 complete sheet mills and a large plant for galvanizing the sheets. Natural gas is used as fuel. The mills have an output of 45 carloads of finished steel a day. The town has graded schools and a high school established in 1900; a public library and eight churches. There are two newspapers and good banking facilities. Vandergrift was founded by the Apollo Iron and Steel Company on 650 acres of land, upon which they erected their works in 1896 and 1897. The value of the works is estimated at $5,500,000. The town is very remarkable as a successful demonstration of the economic principles and is known in the iron world as the "workingman's paradise." The town was laid out and sewered, and water, electric light and gas plants built, streets paved, trees planted, etc., before a single lot was sold to the employees. Nearly all the homes in the town are owned by those who live in them, and every lot of land was sold with a stipulation in the deed that no liquors should be sold on any of them for 99 years. The mills have never closed down since they were started, except at intervals for repairs. The workmen are well paid and of unusual intelligence, and belong to no labor union, and the town has never had any labor disturbances. A borough was formed in 1915, taking in most of the town and known as Vandergrift Heights. Pop. 3,876.

VANDERLIP, Frank Arthur, American banker: b. Aurora, Ill., 17 Nov. 1864. His boyhood was spent on a farm, and after a country school education he became an apprentice in a machine shop of his native town. He studied stenography nights and next was employed as reporter on a local newspaper. He was for some time student at the University of Illinois and the Chicago University. He was successively reporter and financial editor on the Chicago *Tribune* (1890–94); associate editor of the Chicago *Economist* (1894–97). He became private secretary to Lyman Gage, Secretary of the Treasury, 4 March 1897, but his knowledge of finance and his executive ability were quickly noted and on 1 June of the same year President McKinley appointed him Assistant Secretary of the Treasury. He resigned this office in 1901 to become vice-president of the National City Bank of New York, of which he has been president since January 1909. In 1901 Vanderlip visited Europe to study financial and industrial conditions, and in 1902 he went as delegate to the International Conference of Commerce and Industry, held at Ostend, Belgium. He is identified with many financial and commercial enterprises. Shortly after the entry of the United States into the World War he was made chairman of the War Savings Committee, and in September 1917 he was appointed by the Secretary of the Treasury McAdoo to conduct the sale of War Savings Certificates. He has written 'The American Commercial Invasion of Europe' (1902); 'Business and Education' (1907); 'Modern Banking' (1911); 'Business and Politics' (1915); "International Banking" of the section BANKS AND BANKING in this Encyclopedia; also many important papers on finance and economics.

VANDERLYN, John, American artist: b. Kingston, Ulster County, N. Y., 1776; d. there, 23 Sept. 1852. He was a pupil of Gilbert Stuart and patronized and helped by Aaron Burr, was enabled to go to Paris in his 20th year, where he studied for five years and there practised his profession for 12 more. His 'Marius Among the Ruins of Carthage' was awarded a gold medal by Napoleon I. Another famous picture of his is the 'Ariadne in Naxos,' now in the Pennsylvania Academy of Fine Arts. This is one of the finest nudes which have appeared in the history of American art, being simple and natural in treatment, pure and delicate in tone and line and tenderly pathetic. As a portrait painter he achieved successes not unworthy of his master Stuart. Among his sitters were Washington, Monroe, Madison, Calhoun, Clinton, Zachary Taylor and Aaron Burr. He also painted for the last-mentioned friend a portrait of himself now in the New York Metropolitan Museum of Art. Nevertheless he failed in meeting with the success and appreciation he desired and expressed his bitter disappointment by declaring "no one but a professional quack can live in America." Poverty and discouragement appear to have crushed and paralyzed his energies, and in the autumn of 1852 he returned to his birthplace so poor that he was forced to borrow a shilling to pay for the expressage of his trunk to the town. He asked for a bed at the hotel and next morning was found dead.

VANDERVELDE, Emile, Belgian Socialist, statesman and author: b. at Ixelles, 1866. He took his degree as doctor of laws in the University of Brussels (1885) and became doctor of social science in 1888 when he founded the circle of student Socialists. He became a member of the International Socialist Bureau and was elected a deputy for Charleroi (1894) and was again chosen from Brussels (1900–06). He took a prominent part in the Great War, became the premier of the Belgian war ministry and was a member of the commission which came to the United States in September 1914 to make a protest to the American President against the German maltreatment of that people. His writings are noted for their clearness and precision and include 'Les Associations professionelles d'artisans et d'ouvriers en Belgique' (1892); 'La question agraire en Belgique' (1897); 'Le socialisme en Belgique' (1898); 'L'Alcoolism et les conditions du travail en Belgique' (1899); 'La propriété foncière en Belgique' (1900); 'L'Exode rural et le retour aux champs' (1903); 'Le socialisme et l'agriculture' (1906); 'La Belgique et le Congo' (1911); also an English translation 'Collectivism and Industrial Revolution' (1901).

VANE, SIR Henry, English statesman, fourth governor of Massachusetts: b. Hadlow, Kent, 1612; d. Tower Hill, London, 26 May

1662. He studied at Magdalen Hall, Oxford, and also for a time at Geneva or Leyden; was a member of the retinue of the English Ambassador to Vienna in 1631, and after his return was so decided in his opposition to the doctrine and ceremony of the Established Church that he sailed for New England to obtain freedom of conscience. With royal license permitting a three-years' residence, he arrived at Boston 6 Oct. 1635. He was at the time a joint commissioner representing Lord Saye and Sele, Lord Brooke and the other patentees of Connecticut. On 1 November he was admitted a member of the church of Boston, on 3 March 1636 received the freedom of the colony (that is, was made citizen). He had already taken some part in its political affairs, having effected a conference for the adjustment of differences at which articles were drawn up for the guidance of magistrates. He was elected governor 25 March 1636. The "fifteen great ships" then in harbor, according to Winthrop ('History of New England,' ed. Savage, 1825), "congratulated his election with a volley of great shot." One of his first acts after induction into office was to make an agreement with the captains of these vessels as to the government of shipping. A difficulty arose through the request of the officers of British vessels that the king's colors might be flown from the fort. All the magistrates, with one exception, were opposed, since the flag contained the cross which Endicott had but recently cut away. Reply was made that there was no king's flag in the colony, but the captains supplied one and it was hoisted on the authority of the governor and his supporter in the council. At the outbreak of the Pequot War Vane joined Roger Williams in influencing many Indian tribes to refrain from hostilities. On 21 October he concluded a satisfactory treaty with Miantonomo, sachem of the Narragansetts. But in his interposition in ecclesiastical matters he was far less successful. The Antinomian controversy was reaching a critical stage and the colony was divided into two hostile camps, one holding to "sanctification" as evidence of "justification" and the "covenant of works," the other to the "covenant of grace." The latter were in a minority and far less influential, and Vane, as a champion of free inquiry, took their side. The colonists, unfortunately, did not, as Upham points out, favor such inquiry "whenever it threatened to lead to results different from their own." As a consequence, at the election in March 1637, Vane and all his supporters were left out of office. Boston chose him to the General Court, and when the election had been declared void by the majority of the house, returned him the very next day. Winthrop was elected governor, and at once, as a means toward defeating heresy, a law was passed by the General Court that no strangers were to be received within the jurisdiction of the colony save those permitted by one of the council or two of the assistant magistrates. Discontent with this law so increased that Winthrop published a 'Defense.' To this Vane replied in 'A Brief Answer to a Certain Declaration,' a plea for toleration. On 3 Aug. 1637 he sailed for England. On his return, he labored to secure a charter for Rhode Island, and this was obtained chiefly by his influence. His services in this behalf were duly recognized by Williams. From 1639 to 1641 he was treasurer of the British navy, in 1640 entered Parliament for Hull, in the same year was knighted and in 1641 advocated the abolition of episcopacy and was dismissed by Charles I from the treasurership. He was head of the Parliamentary war party, was practically leader of the Commons in 1643–46, was a commissioner to treat with Charles I at Newport in 1648, but took no part in the king's trial. Under the Commonwealth he was a leader in all affairs of state. In 1651 he was sent to adjust Scottish affairs. When Cromwell forcibly dissolved the Long Parliament in 1653, Vane, who desired to continue it, was brought into open collision with him. Vane, therefore, withdrew to Belleau in Lincolnshire, where he busied himself with literary composition. One of Milton's sonnets (17th) recognizes his activity in the Commonwealth cause. In 1656 he was imprisoned for a pamphlet against Cromwell's arbitrary procedure, in 1659 re-entered Parliament and having secured the abolition of the protectorate, was commissioner of the navy in the restored Long Parliament, from which he was finally expelled January 1660, generally distrusted by all parties. He was excluded from indemnity on the Restoration, held prisoner in the Tower and the Scilly Islands, and finally, after an able defense, sentenced to death for treason. His mystical religious views made him a puzzling character to his English contemporaries, most of whom apparently came to think him a fanatic. He was reported at one time to be the head of an Anabaptist revolt; at another, king of the Fifth Monarchy. His abilities were never questioned, but his high principles were once not seen so clearly as they now are. He appears briefly in Hawthorne's 'Legends of the Province House' ('Howe's Masquerade'). Consult biographies by Sikes (1662), Upham (Sparks' 'American Biography,' 1st ser., Vol. IV, 1835), and Hosmer (1888); also Winthrop, 'History of New England' (ed. Savage, 1825 or ed. 1853), and Hutchinson, 'History of Massachusetts' (ed. 1765).

VANGUARD. See ADVANCE GUARD.

VANILLA, a genus of orchids, of great economic value, on account of their fruits, which furnish the commercial flavoring-extract known by the same name. Several species furnish vanilla, the most important being *V. planifolia*, indigenous to Mexico and adjacent territories. It is a robust high-climbing plant, attaching itself to trees by adventitious roots. It bears bright-green, oval, flat leaves, which are fleshy or coriaceous. The flowers are fragrant and greenish-white, with a trumpet-shaped lip, crinkled about the edges. When cultivated, as it is very largely, in tropical countries, especially in Mexico and Java, the flowers must be fertilized artificially, the finest being chosen, a process carried out by insects in its wild habitat. They then set fleshy fruit, which is carefully picked just before each is ripe. These pods are from six to nine inches long and are filled with an oily pulp containing the minute seeds. They are called vanilla beans from their long, slender legume-like appearance, but are not fragrant. The characteristic aroma is due to the presence of a volatile oil (vanillin) which is developed by slow curing and fermentation. The pod, as it appears in the markets,

is chocolate-colored, wrinkled, slender and pliable. In the best qualities, or "frosted vanilla," the vanillin extrudes its needle-like crystals, forming a delicate efflorescence on the outside of the beans. Although vanilla is a carminative and stimulative drug, it is chiefly used as a flavoring substance, particularly for chocolate and confectionery. The Spaniards found vanilla in use among the Mexican Indians, in conjunction with cocoa, and it is said that it was first imported into England about 1510, when other Mexican products found their way over seas.

There are several inferior qualities of vanilla, such as the Venezuelan and Brazilian varieties, brought from those countries, the latter being distinguished as vanillon, and supposed to be the product of *Vanilla pompona*. The pods are longer and thicker than those of *V. planifolia*. Guiana vanilla pods (*V. guianensis*) are coarse and frequently split open.

VANILLA GRASS (*Savastana odorata*). See GRASSES IN THE UNITED STATES; SWEET GRASS.

VANILLA PLANT, a tall herb (*Trilisa odoratissima*), with tubular magenta flowers in spreading corymbose panicles, growing in the southern United States. The foliage when dried has the odor of vanilla and the leaves are used by the Southern negroes to scent their houses. The vanilla plant also serves to improve the flavor of fine-cut tobacco.

VANINI, vä-nē'nē, **Lucilio,** Italian free-thinker: b. Taurisano, about 1585; d. 19 Feb. 1619. At Naples and Padua he studied the new learning of the Renaissance and the newer learning of physical science, qualified as doctor *utriusque juris* and took orders as priest. But his "naturalist" views, which were regarded as atheistic, soon brought him into collision with the Church. He taught in France, Switzerland and the Low Countries and fled from Lyons to England, where he was imprisoned. Later he went to Toulouse, where he was arrested and condemned to have his tongue cut out, to be strangled and to be burned to ashes. He was burned on the day of his condemnation. His 'Amphitheatrum Æternæ Providentiæ' (1615) and his 'De Admirandis Naturæ Arcanis' (1616) set forth his pantheistic opinions. As an independent thinker and in the doom which he suffered he has many points in common with Giordano Bruno (q.v.), although as a philosopher he has no claim to be ranked with him. Consult Owen, 'Skeptics of the Italian Renaissance' (1893) and monographs by Fuhrmann (1800), Vaisse (1871) and Palumbo (1878).

VANISHING FRACTION, in mathematics, a fraction which reduces to the form $\frac{0}{0}$ for a particular value of the variable which enters it, in consequence of the existence of a common factor in both terms of the fraction, which factor becomes 0 for this particular value of the variable. See FRACTIONS.

VANISHING POINT, in perspective, that point to which all parallel lines in the same plane tend in the representation.

VANITY FAIR. Thackeray's 'Vanity Fair' is perhaps the most famous novel in the English language; certainly no critic would name the five best novels in English and not include 'Vanity Fair.' It is hard for a novel to keep its place in the public mind; only a remarkable novel can do so. Each new generation comes to novels with a new appetite, with demands for some fresh interpretation of life, some exposition, some consideration, some solution if possible, of the new problems that confront it, and it finds novels of the preceding generation wofully old-fashioned. Nevertheless, 'Vanity Fair,' although written in 1846–48, is not old-fashioned. Becky Sharpe is still a familiar and intimate companion; Sir Pitt Crawley, the Marquess of Steyne, Major Dobbin are still among the best known of our acquaintances in the world of fiction.

Of course a novel 70 years old cannot affect us in the same sort of way that it affected its first readers. To them 'Vanity Fair' was a new kind of novel. They were acquainted with novels of several well-marked types, such as 'Tom Jones,' an out-of-door, free-hand, picture of a rowdy young man, 'Pamela,' the elaborate presentation of sentimental situations, 'Pride and Prejudice,' the delicate delineation of manners, 'Ivanhoe,' the romance of adventure, and they were beginning to know Dickens; but Thackeray's detached, cynical, sentimental survey of life was new and strange. Since then novels have multiplied, they swarm like locusts, and yet 'Vanity Fair' has its own peculiar power and interest; its place in literature is better established than ever. It was this novel that made Thackeray famous. And though it was followed by 'Pendennis,' 'Esmond' and 'The Newcomes,' it stands, in the general opinion, as his most brilliant novel.

The defects in the book according to the taste of to-day are obvious enough. Artist as he is in details Thackeray lacks the power or the will to make his novel as a whole a work of art. We do not like to have the author poke his head out from the pages every little while and moralize over his characters; we grow tired of the frequent comparisons of life to a pantomime; we find the characters Pitt Crawley, George, Amelia, Dobbin exaggerated, out of drawing, distorted. Thackeray does not hold a mirror up to life; he holds up a warped and twisted reflector that gives the life it reflects a half comic, half satirical aspect. Thackeray's admirers are many and devoted, but for most readers he is too much occupied with the superficial relations of life, with social distinctions, with the envy and vulgarity of those below and the snobbishness and vulgarity of those above. Greater men, such as Shakespeare or Tolstoi, do not find their attention drawn to such matters, they find their interest in experiences, emotions, passions, of a kind more deeply human, they delineate men and women as more occupied with the larger matters of life, love, work, discipline, excellence and so forth, and less concerned with the meaner failings of ill-adjusted social classes.

And yet despite these defects 'Vanity Fair' is a novel that represents some manifestations of human society, with remarkable truth. In Becky Sharpe Thackeray accomplished what is commonly accepted as a very great achievement of art, the portrait of a woman who exhibits a familiar human trait so definitely that without losing her individuality she represents a type. Such a portrait has the freshness of

novelty, and it has also the interest that attaches to the familiar. This effect Thackeray achieves with surprising swiftness and sureness. Becky Sharpe within the first page or two leaves Miss Pinkerton's academy for young ladies and we see her opening her wings like a young hawk, just fledged, casting its far-seeing, pitiless eyes about for prey. No sooner do we see that hawk glance than we watch, entranced, for the great circles through the air and the cruel pounce. Becky Sharpe belongs to the order of *raptores,* creatures that arouse in us all a mixture of apprehension and fascination. Every wild bird has a tragic end, and Becky's career squares with our experiences of life.

Thackeray is a master of English; his flexible sentences adapt themselves like running water to every circumstance, they flow limpidly, they babble, they rush along, or move deep and slow. In this respect by general consent he stands at the head of English novelists, and it is perhaps his command of language that enables him to shift so easily from pathos to humor, from tragedy to comedy, from satire to sympathy; and in 'Vanity Fair' his style is at its best.

HENRY D. SEDGWICK.

VANITY OF HUMAN WISHES, The. Ostensibly a formal satire in heroic couplets (368 lines) published by Dr. Samuel Johnson in 1749, more than a decade after the appearance of his other notable satire, 'London.' As that had followed in a way the third satire of Juvenal, so this followed the tenth. In the interval between the two Johnson's style had grown more rotund and he himself had ripened into a dignified moral essayist soon to give expression to his views of life in *The Rambler.* Indeed, it might be held that 'The Vanity of Human Wishes' is more of a weighty essay in verse than it is of a keen satire. This point need not be pressed, however, nor need we emphasize Macaulay's well-known comparison with the Tenth Juvenal. What mainly matters is that Johnson, although probably more of a rhetorician than of a poet, gave the readers in this essay, or satire, one of the best pieces of sententious poetry in the language. The famous portraits of Wolsey and of Charles XII of Sweden fail to impress but few readers, and there are other passages and single lines equally memorable — e.g., "Toil, envy, want, the patron, and the jail," and "Superfluous lags the veteran on the stage"— the first truer of Johnson's own career than the second. Tested by any standards of poetry in which an appeal to the intellect is given due weight, 'The Vanity of Human Wishes' is worthy of the fame of its author; but it must be admitted that it does not touch the heart so deeply as the simple stanzas Johnson wrote on the death of his friend, the old quack-doctor, Robert Levet.

WILLIAM P. TRENT.

VANLOO, vän-lō, Jacob, Dutch painter: b. Sluis, about 1614; d. Paris, 26 Nov. 1670. He was made a member of the French Academy, and was famous in his time as a painter of portraits in the style of Der Helst and Rembrandt; scenes from fashionable life; and mythological pictures such as 'Diana and her Nymphs' in the galleries of Berlin and Brunswick, and 'Œnone' in that of Dresden.

VANLOO, Jean Baptiste, Dutch painter: b. Aix, 11 Jan. 1684; d. there, 19 Sept. 1745. In 1731 he was elected to the Academy; produced many portraits, including that of Louis XV, and mythological pictures, such as 'Diana and Endymion' (in the Louvre); 'The Triumph of Galatea' (in the Hermitage at Saint Petersburg). His son, LOUIS MICHEL VANLOO (b. Toulon, 1707; d. Paris, 20 March 1771), studied in Rome and Paris, in which latter city he became a member of the Academy. Settling at Madrid he was appointed court painter to Philip V, and there are three portraits of the Spanish royal family by him in the Prado Gallery and an allegorical picture.

VANLOO, Louis, Dutch painter, son of Jacob Vanloo (q.v.): b. Amsterdam, about 1640; d. Aix, 1712. At Paris he carried off the first prize of the Academy. His more illustrious son, CHARLES ANDRÉ, was both painter and sculptor, and studied at Rome under Lé Gros. In 1719 he went to Paris and assisted his brother Jean Baptiste Vanloo in restoring the frescoes at Fontainebleau. He was received into the French Academy in 1735, made professor there two years later, in 1763 director of the Academy and first painter to the king. In the Louvre are his 'Æneas Carrying Anchises from Troy' (1729); 'Marriage of the Virgin' (1730); 'Apollo and Marsyas' and a portrait of 'Queen Maria Leczinska' (1747).

VANN, vän, Irving Goodwin, American jurist: b. Ulysses, N. Y., 3 Jan. 1842. He was graduated at Yale in 1863, and at the Albany Law School in 1865, and in the following year began to practise in Syracuse. In 1879 he served as mayor of that city. From 1882 to 1896 he was a justice of the New York Supreme Court, and in 1896 was appointed by the governor a judge of the Court of Appeals, to which position he was elected in 1897 for the term of 14 years. He was one of the founders of the Onondaga County Bar Association, and has been president of the New York State Bar Association. He has been lecturer in the Albany, Cornell and Syracuse law schools.

VANNES, vän, France, a seaport town, capital of the department of Morbihan, on the Vannes, where it falls into a narrow inlet of the Gulf of Morbihan, 68 miles northwest of Nantes. It is a railway junction, is a walled town, and has narrow gloomy streets overhung by antiquated timber houses. The principal buildings are the cathedral, the modern town-hall and Jules Simon College. The town possesses a museum, rich in Celtic antiquities. The manufactures consist of coarse cotton goods, lace, leather and ropes. There are shipyards and ironworks. The trade is in corn, hemp, honey, wax, butter, salt, tallow, cider and wine. Pop. (1911) 17,842; communal population, 25,000.

VANNUTELLI, vạn'noo-tĕl'lē, Vincenzo, Italian Cardinal: b. Gennazzano, Italy, 5 Dec. 1836. At the age of 14 he entered the Capranica College, Rome, pursued his studies in philosophy and theology and graduated from the institution with highest honors. Ordained to the priesthood by Cardinal Patrizzi, 23 Dec. 1860, the following year he was named bene-

ficiary of Saint Peter's, and in 1863 was appointed auditor to the Papal Internuncio in Holland, being auditor at Brussels in 1866. In 1875 he became an assistant in the Papal Secretariate of State, and in 1878 was named auditor of the Rota. Elevated to the titular archiepiscopal see of Sardis, 20 Jan. 1880, the distinguished churchman was subsequently appointed Apostolic Delegate to Constantinople, sent as papal representative to the coronation of Alexander III of Russia, and later chosen Nuncio to Lisbon. At the Consistory of 30 Dec. 1889, he was created cardinal and reserved *in petto,* being proclaimed, 23 June 1890, with the presbyteral title of S. Silvestro in Capite. April 1900, Cardinal Vannutelli was appointed to the suburbicarian episcopal see of Palestrina, and became Bishop of Ostia and Palestrina, Archpriest of Saint Maria Maggiore, dean of the Sacred College and datarius to His Holiness. He also served as prefect of the Sacred Congregation of the Council and prefect of the Apostolic Segnature (Signature), and was entrusted with many diplomatic missions, having been Papal Legate to the Eucharistic Congress of Brussels 1898; Tournai 1906; Metz 1907; London 1908; Cologne 1909, and Montreal 1910.

VANUXEM, Lardner, American geologist and chemist: b. Philadelphia, Pa., 23 July 1792; d. Bristol, Pa., 25 Jan. 1848. He was graduated from the Ecole des Mines at Paris in 1819, and in 1820–26 occupied the chair of chemistry and mineralogy at the South Carolina College. He resigned in the latter year in order to adopt geology as a profession, and in 1827–28 he was engaged under the New York legislature in studying the geological aspects of New York, Ohio, Kentucky, Tennessee and Virginia. He was State geologist for New York in 1836–42, was a promoter of the Association of American Geologists organized in 1840, and in addition to numerous scientific papers, he published 'An Essay on the Ultimate Principles of Chemistry, Natural Philosophy and Physiology' (1827); and 'Geology of New York, 3d District' (1842).

VANVITELLI, Luigi, loo-ē'jē vän-vē-tĕl'lē, Italian architect: b. 1700; d. 1773. He was appointed architect to Saint Peter's at Rome in 1726; and he erected, while in the prime of his powers (1752), for Charles III of Naples, the magnificent palace at Caserta with its gardens and cataract. As an example of late Renaissance architecture in Italy this palace is scarcely paralleled by any building in Europe.

VAPEREAU, văp-ē-rō, Louis Gustave, French scholar and compiler: b. Orleans, 4 April 1819; d. 1906. He was educated at the Ecole Normale, Paris; was professor of philosophy at the College of Tours, 1843–52; admitted to the bar in 1854; and about the same time made editor of the famous 'Universal Dictionary of Contemporaries' (1858, with numerous later editions). Among his other important works are 'Literary and Dramatic Year' (1859–69); 'Universal Dictionary of Literatures' (1876), and 'Historical Elements of French Literature' (1883–85). In 1870–71, during the German invasion, he was prefect of Cantal, and afterward prefect of Tarnet-Garonne. He was inspector-general of primary schools from 1877 to 1888, and received the Cross of the Legion of Honor in 1878.

VAPOR, in physics, a term used to designate the gaseous form which a solid or liquid substance assumes when heated. Vapor is, therefore, essentially a gas, and seeing that all known gases have now been proved to be liquefiable, no physical difference can be said really to exist between an ordinary gas, such as oxygen, and a vapor, such as steam. In common language, however, a difference is usually recognized; a gas is a substance which at ordinary temperatures and pressures exists naturally in a state of vapor; while a vapor is produced by the application of heat to a substance which normally exists in a solid or liquid form. In technology the term vapor is more commonly restricted to denote the gaseous phase of a substance given off at a temperature below its specific boiling point. The difference has been otherwise explained to be one not so much of kind as of degree; steam in the boiler of a steam-engine being said to be in a state of vapor, while superheated steam is said to be a gas. Aqueous vapor formed on the surface of the land and water is always present in suspension in the atmosphere and when it meets with a reduction of temperature it condenses into water in the form of rain or dew, or into ice, as hoar-frost. See GAS.

VAPOR LAMPS, a form of lamp used in electric lighting in which a rarefied gas is rendered luminous by the passage through it of an electric current. All other forms of artificial light now in practical use depend for their lighting properties upon the incandescence of a solid — either in the form of a filament of carbon or tungsten as in the ordinary glow lamp or of a rod of carbon as in the arc or of carbon in a finely divided state as in gas and kerosene lamps. The Hewitt vapor lamp, also known as the mercury vapor lamp, derives its light from the vapor of mercury, in which the passage of an electric current causes a high state of incandescence. The lamp is constructed of a glass tube having a metal sealing-in wire at each end. These wires lead the current to the electrodes, one or both of which are of mercury. The tubes are exhausted to a high degree on a vacuum pump and sealed off. This prevents any escape of the vapor which fills the tube. Three types are made: a 20-inch tube operating on direct current; a 50-inch tube adapted for either direct or indirect current; and the quartz or high-pressure lamp, for direct current only. One 330-watt Hewitt lamp will replace nine 32-candle-power incandescent lamps and give much more than twice the amount of light, using only one-third the current. Or the same lamp will replace 12 16-candle-power incandescent lamps, giving over three times the light for one-half the current. The light may be employed to great advantage for purposes where considerable illumination is required and where the ordinary arc light is unsatisfactory on account of its sharp and heavy shadows and its flicker. The light given is bluish green in tint and is a strictly industrial illuminant. In this field its advantages are visual acuity, low intrinsic brilliancy, natural shadows and subdued reflections. It is extensively used in foundries and machine shops,

varnishing and finishing plants, textile mills, printing plants, paper mills, clothing factories, etc. Another great field of application of the lamp is for all sorts of photographic processes. The illumination being so diffused and the light composed to a great extent of the so-called "actinic" or chemically active rays it furnishes for this work, where there has never been a satisfactory artificial illuminant, a perfect actinic substitute for daylight. For the production of a pure white imitation of average daylight it is supplemented by other forms of lamps which add the colored rays missing from the Hewitt lamp. For each candle-power of the mercury light is added 0.57 candle-power of Welsbach; 0.54 candle-power of tungsten and 0.50 candle-power of carbon filament. The Moore light, also called the "vacuum tube" light, is a form of vapor lamp in which the rarefied gas used is either carbon dioxide or nitrogen. The nitrogen tubes give a warm yellow light which is soft as well as brilliant. They are extensively used in public rooms, banquet halls, restaurants, etc. The New York City post office is illuminated with a mile of these tubes. The carbon dioxide tubes give a light whose spectrum approaches most nearly to that of diffused sunlight. Color matching may be done by this light as accurately as by daylight and hence this form of illuminant is invaluable in dye houses, which formerly had to shut down early in winter and altogether on dark days. In the latest forms of the Moore lamp an automatic mechanism is provided for feeding into the tubes from time to time the fresh gas necessary to replenish the amount which becomes inert and, therefore, non-luminous. The neon tube is a form of lamp closely similar to the vapor lamps. It is distinctly a red light, lacking seriously the proper proportion of blue rays. It is useful in many decorative effects and when skilfully assorted with Hewitt lamps affords a perfect imitation of daylight at a lower cost than for any other electric light.

VAPORIZER. See INTERNAL COMBUSTION ENGINE.

VARANGIANS, vā-răn'jĭ-ąnz, or **VARAGIANS,** a word meaning "sworn men," that is, men bound by oath to stand by each other in their undertakings, and derived from the Scandinavian varar, an oath. It is applied to Northmen who entered the service of the Byzantine emperors and were imperial guards at Constantinople, noted for their courage and fidelity, but also taking decisive part, at times, like the Prætorian guards at Rome, in making and unmaking emperors. The Varangians were not always Northmen in the restricted sense of that term, but included Saxons and other Germans. The designation is also applied to the adventurers from Scandinavia who founded principalities in Russia which were the beginning of the great Russian empire and powerful enough for a time to threaten the overthrow of the Byzantine dominion.

VARANIDÆ, Varanus, the family and type genus of the lizards called monitors. See LIZARD; MONITOR.

VARDAMAN, James Kimble, American journalist and legislator: b. Jackson County, Tex., 26 July 1861. He was educated in the public schools of Yalobusha County, Miss., read law at Carrollton, Miss., and in 1882 was admitted to the bar and began practice at Winona. In 1883 he became editor of the Winona *Advance* and from 1890 to 1896 edited the Greenwood *Enterprise* and *Commonwealth.* He became editor of *The Issue* at Jackson in 1908. Taking an active interest in politics he was member of the Mississippi house of representatives in 1890–96 and was speaker in 1894. Mr. Vardaman served successively as captain and major of the Fifth United States Volunteer Infantry in the Spanish-American War. In 1895 and 1899 he was an unsuccessful candidate for governor; was elected governor for the term 1904–08; was candidate for the senate in 1907 and in 1911 was elected to the United States Senate for the term 1913–19.

VAREC, the name in Brittany for the crude ash produced by burning seaweed. See KELP.

VARESE, va-rā'zā, Italy, a town in Lombardy, province of Como, 35 miles west of Milan, on the margin of Lake Varese. It has a church dating from the 9th century, though rebuilt several times. It is a popular summer resort and the centre of a silk-spinning industry. Paper, organs, automobiles and carriages are also manufactured and wine is bottled. Pop. communal about 21,605; town 7,721.

VARGAS, Luis de, loo'ēs dā vär'gäs, Spanish painter: b. Seville, 1502; d. there, 1568. He began, after the manner of Spanish painters of the period, by applying water colors to a coarse-textured cloth called "sarga," (serge or bunting) and the pictures thus executed were washed over with thin gum or paste. Curtains for churches and naval ensigns were manufactured in this style, and the painting of sargas was practised by Sevillian artists, including Murillo long after the time of Vargas. But this great painter by breaking away from the traditional Spanish method is notable as having introduced into Seville the best Italian methods of fresco and oil. This he did after visiting Rome 1527; and attaching himself to Pierino del Vaga (q.v.). After the sack of the city in that year he fled with his master to Genoa. He did not leave Italy for his native country until 1555. As a painter he was highly imaginative, and evinces a taste for grandeur and simplicity. His heads are beautiful and full of devotional refinement. In the Chapel of the Nativity in Seville Cathedral he painted his 'Navidad' in 1555, but his masterpiece is 'The Temporal Generation of our Lord' which represents the human ancestors of Christ adoring the Madonna and Child.

VARIABLE, General Theory of Functions of Complex. See COMPLEX VARIABLE, GENERAL THEORY OF FUNCTIONS OF.

VARIABLE, Theory of Functions of the Real. See REAL VARIABLE, THEORY OF FUNCTIONS OF.

VARIABLE QUANTITIES, in mathematics, are algebraic symbols placed in relationship one to another so that if different numerical values are given to a particular letter the other letters will have corresponding values or sets of values.

VARIATION, in biology, the physical departure in any direction from the mean character of a species. When the variation in a

large number of individuals, generally more or less isolated in locality, is of a marked and constant type, the group of individuals which exhibits such variation is termed, technically, a «variety.»

Variation, strictly speaking, is regarded as distinct from the processes of evolution, which result in the formation of new species, and is limited to the individual variations within the species. Variations may be either collective or individual. The former are those arising from the carrying over of certain peculiarities of individual variation from generation to generation. They thus tend to become fixed; and receive the name of «mutations.» Individual variations may be blastogenetic — that is, inborn; or ontogenetic — that is, acquired through the exigiencies of individual environment. In the latter case they are called «fluctuations.» Discussion has been rife as to whether variation is determinate or indeterminate; that is, whether organisms have or have not a tendency to vary in particular ways. It is the view of the extreme Darwinists that there is primitively no tendency to any special mode of variation, any existing tendency being the result of the selection of those individuals which chanced to vary along these particular lines. Darwin himself held to the idea that adaptation was the secret of such observed changes, and that both the principles of natural selection and of variation played an individual part. According to other biological observers and thinkers there is, apart from the guidance of natural selection, an inherent bias, differing in different groups of organisms toward variation in determinate lines. This may be due to the inheritance of characters individually acquired under the stress of surrounding conditions (direct environmental determinism); or to constitutional tendencies inherent in the individuals of each species, analogous to the inherent tendencies of inorganic substances, to assume definite crystalline forms — (innate specific determinism). According to De Vries there is, in elementary species which cross-breed, a unit characteristic which is not mated; that is, «the differentiating mark is present in one of the parents and not in the other; while all the other units are paired in the hybrid, this one is not. It meets with no mate and must, therefore, remain unpaired. . . . These unpaired qualities constitute the essential features of the hybrids of species, and are, at the same time, the cause of their wide deviations from ordinary rules.»

It has been claimed by certain American biologists that palæontological evidence establishes the existence of determinate variation. The teeth and the limb-bones of more than one series of fossil ungulates are found to exhibit variation along definite and determinate lines. The facts may be admitted; but the reasoning based thereon is inconclusive. The variation adduced is confessedly along lines that are advantageous to the individuals in which it occurs. It would, therefore, on the Darwinian theory, escape that elimination which would be the fate of non-advantageous and neutral variations. If the teeth of mammals varied indeterminately, and if all variations save those along one line (or several correlated lines) were neutral or non-adaptive, these latter would be eliminated through inter-crossing, while the adaptive variation would become evident. In the fossil forms the variations along non-adaptive lines would be so slight as to escape detection, while those in a plus or minus direction along adaptive lines would be assigned to different stages in the evolution of the variation in question.

A. R. Wallace and others have tabulated some results of the observation of variation in the state of nature; and Wallace has shown that variations in size or length of particular parts are considerable, «usually reaching 10 or 20, and sometimes even 25 per cent of the varying part,» and occurring in 5 to 10 per cent of the specimens examined. These results incidentally show that in the species under examination there was no very rigid elimination, and that inter-crossing did not suppress variations from the mean to such an extent as is sometimes supposed.

On the hypothesis of indeterminate variation it must be confessed that we are to-day not much in advance of Charles Darwin, who said: «Our ignorance of the laws of variation is profound. Not in one case out of a hundred can we pretend to assign any reason why this or that part has varied.» Darwin, however, rigorously rejected any doctrine of «chance,» insisting that failure to discover the reasons was due solely to ignorance of well-ordered laws. It is to be remembered that the animal organism is not passive, but reacts individually to environment; thus developing a unit characteristic which may be unpaired in mating and so establish the foundation for a new variety. Consult the works of Charles Darwin, Lamarck, Weismann and Wallace (qq.v.) also Bateson, W., 'Materials for the Study of Variation' (London 1894); Cope, E. D., 'Primary Factors of Organic Evolution' (Chicago 1896); Davenport, C. B., 'Statistical Methods, with Special Reference to Biological Variation' (New York 1904); Lloyd, R. E., 'The Growth of Groups in the Animal Kingdom' (London 1912); Lock, R. H., 'Recent Progress in the Study of Variation, Heredity and Evolution' (New York 1907); Vernon, H. M., 'Variations in Animals and Plants' (New York 1903); Vries, H. de, 'Species and Varieties: Their Origin by Mutation' (Chicago 1906). See DARWINIAN THEORY; EVOLUTION; LAMARCKISM; MENDEL'S LAW; MUTATION THEORY.

VARIATIONS, Calculus of, a subdivision of the differential calculus by which the laws associating the variable quantities are themselves subject to change. See CALCULUS, VARIATIONS OF.

VARICOSE VEINS, a diseased condition of the veins in which they become dilated, and assume a tortuous course, presenting to the touch a soft elastic sensation, except in the situation of their valves, where they form hard knotty swellings, generally of a dark bluish color. This disease occurs most frequently in the lower limbs, and is indeed a very common affection there; but it also occurs in the veins of the spermatic cord, producing varicocele, and in those at the lower part of the rectum, forming in the latter case the tumors called bleeding piles. In the lower limbs varix is often complicated with peculiar indolent ulcers, and sometimes the varix bursts and hæmorrhage takes place, which if not speedily stopped may lead to death. Varicose veins are caused by

some obstruction to the free return of the venous blood toward the heart under pressure of the action of the capillaries. The veins are enlarged in diameter, and lengthened through this pressure, and their walls become very thin in some cases, and may even break under the skin exhibiting more or less extravasation. Such obstruction may arise from tumors within the abdomen, enlargement of the liver causing pressure on the ascending vena cava, pregnancy, constipation of the bowels, tight gartering and other causes. As to the treatment, the first step of course is to remove the cause of the disease, whenever that is possible. If the disease is grappled with at an early stage much good may be effected by enjoining complete rest in a horizontal posture, by bathing the limb with cold water twice or thrice a day, and by the use of a properly applied bandage or laced stocking. In moderate cases the condition may be greatly improved and is often dissipated by the continuous wearing of a snugly fitting elastic stocking. When the disease is far advanced no radical cure can be effected except by a surgical operation in which the obstructed part of the vein is excised. The patient will generally do better to rest content with a palliative treatment.

VARILLA, vä-rē-lä, **Philippe Bunau,** French engineer and diplomat: b. Paris, 26 July 1859. He was graduated from the École Polytechnique, entered the civil division of French engineers, planned and directed the construction of harbor-works and railways in Algeria and Tunis, and in 1884 became connected with the De Lesseps Panama Canal enterprise, work on which had then been proceeding about two years. At his suggestion many radical changes were made in the original plans. In regard to the question of an isthmian canal he published in 1892 'Panama: Le passé, le présent, l'avenir.' His active work in connection with the Panama Canal Company ended in 1888. He spoke several times in the United States in advocacy of the Panama route, and after the revolution (see PANAMA) was chosen as representative of the new republic of Panama at Washington. In the spring of 1904 he returned to France and subsequently became manager of the Madrid-Cacéres Railway. Among his other works as an engineer were the Kongo Railway, West Africa, and the improvements of navigable waterways in Rumania. He invented an electric excavating machine. In the Great War of 1914–18 M. Varilla was in active service and lost a leg during the struggle for Verdun.

VARINAS, vä-rē'näs, or **BARINAS,** Venezuela, a town in the state of Zamora, on the right bank of the river San Domingo, 80 miles southeast of Merida. It is a neat place, at the opening of a valley about 600 feet above the sea-level, with a mean annual temperature of 82°. It has a church and a hospital and is the terminus of a telegraph line. Cacao, coffee and tobacco are cultivated in the neighborhood, but the town and its industries have much declined in recent years. It was formerly the heart of a famous tobacco district. Pop. about 5,300; formerly 12,000.

VARIOLA, smallpox (q.v.).

VARISCITE, vär'ĭ-sīt, a native hydrous phosphate of aluminum, having the formula $AlPO_4.2H_2O$. It has a brilliant vitreous lustre, and usually a rich grass green color, more rarely bluish or whitish, and occurs most frequently as an incrustation. A massive variety in nodular formation found in Utah is called Utahlite (q.v.). Individual crystals have orthorhombic symmetry; they are rarely well developed, being usually clustered into little sheaf-like aggregates, which densely coat the surfaces of the matrix. Its hardness is 4 and specific gravity about 2.4. Its best-known American localities are in Arkansas and Utah.

VARNA, vär'nä, Bulgaria, a fortified seaport town on the west shore of the Black Sea, at the mouth of a river of the same name, 160 miles northwest of Constantinople. It exports wheat, maize, cattle, attar of roses, etc., and imports woolens, metals, sugar, coffee, leather, haberdashery, machinery, etc. The harbor has been modernized, and Varna is now an eastern terminus of the Bulgarian railway system. It is the see of a Greek and a Bulgarian archbishop. In 1444 Ladislaus, king of Hungary, was defeated and slain by Amurath II, sultan of the Turks, near his town. In 1828 it was taken possession of by the Russians, but was restored to the Turks in the following year by the Peace of Adrianople. In 1854 the Crimean expedition sailed from it. It is the chief city of the district of Varna, which has an area of 2,554 square miles and a population (1918 est.) of 325,000. The city's population is about 45,000.

VARNHAGEN, värn-ä'gĕn, **Francisco Adolphe de,** Brazilian historian: b. São João de Ypanema, Brazil, 17 Feb. 1816; d. Vienna, Austria, 29 June 1878. He was taken to Portugal when very young, educated in the royal military college and in 1833–34 served in the constitutional army against Dom Miguel. He afterward engaged in historical researches, returned to Brazil in 1841 and during the remainder of his life was largely occupied on various diplomatic missions in South America and in Europe. As a historian he ranks easily at the head of Brazilian men of letters, his work displaying profound research and presented with clearness and force. He edited and published various historical documents, contributed numerous papers to the 'Revista do Instituto do Brazil,' and wrote 'Noticias do Brazil' (1852); 'Historia geral do Brazil' (1854–57); 'Das wahre Guanahani des Columbus' (1869); 'L'origine Touranienne des Américains Tupis-Caribes, et des anciens Egyptiens' (1876), etc.

VARNHAGEN VON ENSE, värn'hä-gĕn fŏn ĕn'sĕ, **Karl August,** German soldier, diplomat and author: b. Düsseldorf, 21 Feb. 1785; d. Berlin, 10 Oct. 1858. He studied at Berlin, Halle, and Tübingen, assisted Chamisso in the latter's 'Musenalmanach' (1804), in 1809 entered the Austrian army, fought at Aspern and Wagram, and after the peace was made adjutant to Prince Bentheim. Then he entered the Russian service as captain, served in Tettenborn's corps, and wrote a 'Geschichte der Kriegszüge Tettenborns' (1814). He accompanied Prince Hardenburg to the Congress of Vienna (1814), and in 1815–19 was Prussian Minister-Resident at Carlsruhe. Subsequently he lived chiefly at Berlin. He was particularly successful in biographical portraiture, though at times relying overmuch on the anecdotal

method. Among his published works are 'Goethe in den Zeugnissen der Mitlebenden' (1823); 'Biographische Denkmäler' (1824–30); 'Denkwürdigkeiten und Vermischte Schriften' (1843–46; 2 additional vols., 1859); 'Tagebücher' (1861–72); 'Ausgewählte Schriften' (1871–77).

VARNHAGEN VON ENSE, Rahel (Levin), German author: b. Berlin, 1771; d. 1883. She was well known in literary circles and exercised a notable influence over her husband's literary career. He published a memorial of her, 'Rahel, ein buch des andenkens fur ihre freunde' (3 vols., 1834; new ed., 1903), and 'Galeric von Bildnissen aus Rahels Umgang' (2 vols., 1836). After his death appeared 'Briefuechsel Zwischen Rahel und David Veit' (2 pts., 1861), and Briefwechsel Zwischen Varnhagen von Ense und Rahel' (6 vols., 1874–75). Consult Key, Ellen, 'Rahel, eine biographische skizze' (Berlin 1907).

VARNISH. A solution of gums or resins which is applied to the surface of objects to afford a glaze and protect the article so coated. Its use is largely decorative and applied to enhance the appearance of woodwork (furniture and house fittings) as it brings out the beauties of the grain and color of woods more distinctly and permanently and at less cost than the process of polishing, being applied with a brush similarly to painting. Varnish is also used as an upper or outside coating of paint to enhance and make more permanent the pigments. The ancient Egyptians were acquainted with the art of varnishing, but its origin appears to have arisen in the East. In India, China and Japan the practice of lacquer work, a species of varnish application, was known at a very early date. It has been claimed that Japan was acquainted with the art of lacquering 500 or 600 B.C., but the majority of authorities place its first usage there to the 3d century of our era, as an art acquired from their neighbors the Coreans. The natives of China and India probably knew the art much earlier than the Japanese. Varnish and lacquer work are, however, generally treated in the arts as separate and distinct. True varnish does not appear to have been known in Europe till the 17th century.

A practical varnish will cover the following requirements: It must be a homogeneous fluid or solution; must be fixed or permanent in effect as to tone of color, transparency (or opaqueness), and must, on application in thin layers by brush or otherwise, dry within a short period by evaporation of its volatile solvents (alcohol, ether, benzene, spirits of turpentine, etc.), leaving a film of smooth, lustrous (sometimes purposely dull), elastic oil and resin, impervious to its surrounding atmospheric conditions. It must when dry be free from cracks or flaws. In general varnishes may be divided into natural, oil, spirit and water varnishes. Natural varnishes so called are the group of lacquers as used in India, China and Japan and are produced in liquid form by nature as the saps or juices of trees (*Rhus vernicifera*). They are generally treated under the title lacquers (to which refer) and will not be considered here. *Oil varnishes:* These are a product manufactured from linseed oil, gum resins, driers, and a solvent such as turpentine or white spirit. The gums are largely fossil resins. Oil varnishes in commerce are frequently divided into the two general classes: carriage varnishes and cabinet varnishes; both are of very similar character as to composition and manufacture, but the best and most durable for open air use are selected as carriage varnishes, the remainder being termed and used as cabinet varnishes. *Spirit varnishes* consist of a kind made from various resins dissolved in a volatile spirit—methylated spirit (grain alcohol denaturized), turpentine, etc. They are generally made without oil, but some have a small admixture of oil. *Water varnishes* find but small application in the industrial arts. There are lac water varnish, glazing varnish, glue varnish and crystal water varnish. The first makes a good paper varnish and is used on harness, as is also the glue varnish.

Materials used in the manufacture of varnishes may be placed under the following groups: drying oils, resins, gums, solvents and coloring matter. Good drying oils are made from old linseed oil of the best quality (best Baltic preferred). It should be aged at least a year before use by being stored in containers to exclude any attack of the air. While the difference between raw and old stored oils is great, the cause is not known to science, nor have the chemists discovered the reactions caused in ageing. The selection of resins in the ingredients employed is more important than any other, for the lustre and permanence of the products depends absolutely on the qualities of the resins used. Gums as known in commerce are the exudations from trees and consist of what are termed water soluble and spirit soluble. The water soluble gums are of course not correctly used in varnishes as it is required that varnishes shall not be affected by water. For varnishes the resins available for the commercial markets are: amber, kauri, copal, dammar, shellac, mastic, sandarac, benzoin, elemi, animi, pine resin (rosin), asphaltum. Most resins come to the market either in the form of knotty masses, drops, cylindrical pieces or blocks. In the factory the gums are divided into classes as follows: oil varnish gums, as amber, animal, copals, sandarac, rosin and kauri. Ethereal varnish resins are: all oil resins after they have been fused; dammars, mastic, sandarac, rosin, Manila copal. Spirit varnish gums are: lac, Manila copal, sandarac, mastic, rosin, melted resins. The points or characteristics to be considered are hardness, fusibility, solubility, appearance, color. The resins mentioned under oil varnish are insoluble in oils, ether and other solvents, until liquified by fusion; rosins, some soft copals and sandarac are exceptions being soluble in alcohol. The gums grouped under ethereal varnish are more or less soluble in benzol, coal-tar naphtha, turpentine, ether, acetone, etc. The enumerated spirit varnish gums are soluble in alcohol and methylated spirit. Natural coloring matters used in varnishes are: turmeric, gamboge, dragon's blood, gum accroides, aloes, etc. Some artificial or coal-tar colors also enter into the manufacture of varnishes.

Manufacture, Oil Varnishes.—The plant for this class is very simple as is the process, but carrying out of the process requires very great care and experience to produce a com-

mercially successful line. The stages of the process are: (1) melting or running the resin and gums; (2) boiling the oil; (3) mixing the melted gum and boiling oil; (4) boiling the varnish; (5) thinning the boiled varnish; (6) clearing. The gum running is a very delicate operation and the finished varnish depends entirely upon the successful outcome of this process. It is done in a large cylindrical copper vessel, with flat or domed bottom, known as the "gum pot." These pots have flanges near the bottoms which support them in the holes on top of a furnace. In modern varnish works the furnace top is flush with the floor of the gum running shed. These pots have wheels appended to ease movement from the gum running shed to the mixing shed. The pots have hood-covers which connect with flues by stove pipes to allow vent for the noxious vapors. During this running process oil is being boiled in a boiling pot, the oil heated to 500° F. for from one to two hours. The gum is run by heat till it has a steady boil without frothing (which occurs at the start and is the chief source of danger — that of running over). The boiling oil is then added in the correct proportion and thoroughly mixed. The mixture is then poured into a "set pot." The mixed oil and gum are now boiled together to get it thoroughly homogeneous. The set pot is an iron vessel formed like a washing boiler and with a capacity of some 600 gallons. It is set in a specially constructed furnace to hold it. With several runs in it the mixture is boiled at a temperature of from 450° to 500° F. for a time varying from half an hour to four or even five hours, according to the kind of varnish. It has now become a viscous mass and should be clear and transparent. While in the former process the danger was from boiling over, the danger in this process is that of catching fire. For extinguishing such, should the material become enflamed, a shallow pan-shaped cover filled with sand is suspended above the set pot ready to let down and smother the fire. The next process is that of thinning. This is done by removing the set pot of boiled fluid outdoors away from any furnaces or flames where it is mixed with the turps till acquiring the necessary consistency. The next process is the necessary clearing and aging, as freshly made varnish works badly. This process is performed by placing the material in large iron tanks or cisterns and, after hermetically sealing, storing for six months to two years. In this period the insoluble matter slowly precipitates and leaves a clear fluid.

Spirit Varnishes.— These can be made with the same plant as the oil varnishes. The French process is very similar to the procedure given for oil varnishes, the main difference being that these varnishes contain little oil. They are made by running the gums, mixing with oil previously brought to a boil and the mixture boiled till stringy (viscous); after which the mass is cooled and mixed with spirits. In the "common" process the resins are mixed with the solvent and kept in a warm place or heated slightly till the gums are dissolved; therefore, permitting only spirit soluble gums to be used.

Water Varnishes.— These are produced as follows: Lac water varnish contains the proportions of six ounces shellac to one and one-half ounces borax boiled together to each pint of water. Glazing varnish is made with a mixture of egg-white and water preserved by the addition of a little carbolic acid or thymol. Dissolved albumen can take the place of white of eggs. Glue varnish is a solution of the proportions of one pound pale glue to every two gallons of water. The quality and color are dependent, of course, on the kind of glue used — white, brown, etc. It is not water proof and has the defect of being sticky, but is less permeable to water if a little bichromate of potash be added to the ready-made varnish, not during the process of manufacture. Crystal water varnish is produced by dissolving, in the following proportions, one pound of good white gum arabic to one pound of glucose to each three pints of water.

In commerce the different varnishes are known as finishing body varnish for coaches, hard drying or flatting varnish, elastic carriage varnish, elastic hard carriage varnish, pale oak varnish, oak varnish, hard church oak varnish, pale copal varnish, japanners' gold size, black japan, black varnish for carriage iron work, Brunswick black, gold size, balloon varnish, black leather varnish, amber varnish, copal picture varnish, oil varnish, bookbinders' varnish, patent leather varnish, photographic varnish, etc.

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VARNISH TRADE, The. See PAINT, OIL AND VARNISH INDUSTRY.

VARNISH-TREE, a name given to various trees, yielding a sap or secretion that serves for varnish and lacquer. *Rhus verniciflua* furnishes the famous Japanese lacquer (q.v.) and is one of the most important varnish trees. Another very important tree is the Martaban Burmese or black varnish-tree (*Melanorrhœa usitata*), a tree some 60 feet high, called theetsee by the Burmese. When cut it exudes a thick, viscid, grayish juice, blistering in its effects, drying slowly and turning black on exposure. This black varnish is used extensively in Burma for lacquering various vessels, furniture, temples, etc. The fruits of several species of *Semecarpus*, and especially the marking nut, produce a black varnish in India. *Aleurites cordata* is the Chinese, and *Elæagia utilis* the rubiaceous New Granada varnish-tree, the latter secreting in its stipular axils a resinous substance, used by the Colombians as a lacquer. A valuable resin exudes from the trunk of the West India varnish or locust-tree (*Hymenæa courbaril*), a leguminous tree growing to an enormous size and living for centuries. The false varnish-tree is *Ailanthus glandulosa*, or tree of heaven, from China. The Mareton Bay varnish-tree is a tall, evergreen of sub-tropical Australia (*Pentaceras*).

VARNUM, James Mitchell, American general: b. Dracut, Mass., 1749; d. Marietta, Ohio, 10 Jan. 1789. He was graduated from Rhode Island College (now Brown University), studied law and established himself in practice at East Greenwich, R. I. When the Revolution broke out, he was appointed colonel of a

regiment to be raised to the counties of Kent and Kings, and afterward received a commission from Congress when Washington was appointed commander-in-chief. In February 1777, he became brigadier-general; and he commanded all the troops on the Jersey side of the Delaware, when the British and Hessians took possession of Philadelphia. In 1779 he resigned his commission, was delegate from Rhode Island to the Continental Congress 1780–82 and again in 1786–87. In 1787 he was appointed one of the judges of the Northwest Territory, and removed to Marietta, the first city established west of the Ohio.

VAROTARI, vä-rō-tä'rē, **Alessandro** (known also as "IL PADOVANINO"). Italian painter: b. Padua, 1590; d. Venice, 1650. He was the son of Dario Varotari, a Veronese painter, who taught his son the first principles of his art. Alessandro subsequently went to Venice and there devoted himself with enthusiasm to the study of Titian and Paolo Veronese. The pictures he painted at Venice under the inspiration of these masters were most of them destined to adorn the churches of Padua. There are two examples of this painter in the London National Gallery; but his style and admirable coloring are best represented by his 'Marriage of Cana in Galilee' (1622) now in the Academy at Venice; and his 'Judith with the Head of Holofernes' (his grandest production), in the Dresden Gallery, a replica of which may be seen in the Imperial Gallery at Vienna.

VARRO, Marcus Terentius Reatinus, Roman scholar and author: b. Reate, 116 B.C.; d. 27 B.C. He received a liberal education, held a high office in the navy in the wars against the pirates and against Mithridates, and at the commencement of the civil war was serving in Spain as legate of Pompey. When Cæsar marched into that country after the reduction of Italy, Varro was obliged to surrender his forces; but still adhering to the aristocratic party joined Pompey in Greece. His villa at Casinum was plundered by Antony, but Cæsar employed him to superintend the collection and arrangement of the works in the library at Rome designed for the public use. From this time Varro lived in retirement, chiefly at his residences near Cumæ and Tusculum. During the second triumvirate he was put by Antony on the list of proscribed, but by the aid of friends his life was saved, though his libraries were destroyed. He gained the favor of Augustus, who appointed him superintendent of the library founded by Asinius Pollio. Varro was called by Quintilian "the most learned of the Romans," and according to his own statement he had written 490 books by 39 B.C. A list by Saint Jerome gives 74 works, containing 620 books. He wrote historical, antiquarian, biographical, critical, philosophical and geographical treatises, besides others of a miscellaneous character. Some of his works perished with his library, and only one has come down to our time entire, the treatise 'De Re Rustica,' written when he was 80, and the best work on ancient agriculture extant. The best edition is that in the 'Scriptores Rei Rusticæ Veteres Latini,' of J. G. Schneider (1794–97, English translation by Owen 1803). Of a grammatical treatise entitled 'De Lingua Latina,' six books (V–X) out of the original 24 are extant, though mutilated; the best edition is that of Müller (last ed., 1883). Consult Boissier, 'Etudes sur M. T. Varro' (1861).

VARRO, Publius Terentius, Roman poet: b. Atax, Narbonensian Gaul, about 82 B.C.; d. about 37 B.C. He is sometimes distinguished from the preceding by his surname, Atacinius. He was the author of an epic on Cæsar's Gallic campaigns, 'Bellum Sequanicum'; 'Argonautica,' an epic which survives in fragments only; and satires and sonnets.

VARUNA, the noblest of the Vedic divinities. As creator of the world and representative of the all-encompassing heavens he rules the universe. For a reward he offers his abode hereafter; for punishment, he has fetters ever ready for the guilty. In the Vedic ritual only about a dozen hymns are addressed exclusively to Varuna and he is invoked in common with Mitra, the god of light, whose rays constantly seek out all offenders. It is his providence that protects the good and provides the remedies that prevail against the effects of sinning. His great rival in the hearts of the people is India. In the later Indian religion his dominion is confined simply to the sea. Consult MacDonnell, A. A., 'Vedic Mythology' (Strassburg 1897).

VARUS, vā'rŭs, **Publius Quintilius,** Roman general. He was consul in 13 B.C., afterward proconsul of Syria, where he gained the confidence of Augustus by checking an insurrection of the Jews. Six years later he received from the emperor, with whose family he was connected through his wife, the command to introduce the Roman jurisdiction, language and religion into that part of Germany which had just been conquered by Drusus. A general revolt having been secretly arranged by Arminius, Varus was attacked by an immense host and while trying to make his escape had his whole army, consisting of three legions, cut to pieces in a pass of the Saltus Teutoburgiensis. Varus put an end to his own life. The exact scene of this battle is disputed. (See ARMINIUS). In consequence of this defeat the Roman dominion was once more limited, roughly speaking, by the Rhine on the east and the Danube on the north.

VASA, vä'sä, **House of,** a Swedish royal family founded by Gustavus Vasa (Gustavus I, q.v.), who was elected king in 1523. The family held direct possession of the throne until 1654, Gustavus II (Gustavus Adolphus, q.v.) being its most illustrious representative. He was succeeded by his daughter Christina (q.v). who never married. She assumed the government in 1644 and in 1654 resigned it in favor of her cousin Charles Gustavus (Charles X, q.v.), by whom a collateral female branch was introduced. Christina survived until 1689. The house of Vasa gave to Poland three kings, of whom the first began to reign in 1587 and the last, John Casimir, abdicated in 1668. With his death in 1672 this branch of the family became extinct.

VÁSÁRHELY, vä'shär-hĕly, or **HÖD-MEZŐ-VÁSÁRHELY,** hōd'mĕ zė vä'shär-hĕly, Hungary, a large market-town in the comitat of Czongrád, on Lake Hód and the Karoly Canal, leading into the Theiss, 12 miles northeast of Szegedin. Tobacco and wine are grown;

many cattle are reared in the neighborhood and large cattle markets are held in the town. The inhabitants mostly belong to the Reformed Church. Pop. about 65,000.

VÁSÁRHELY, or **MAROS-VÁSÁRHELY,** mär'ōsh vä'shär-hĕly, Hungary, the capital of Maros-Torda County, and a royal free city, in Transylvania, on the Maros, 50 miles east of Klausenburg. Its ancient castle is now used as the garrison barracks and contains a 15th century Gothic church. In the former palace is a large library which possesses a manuscript of Tacitus. The town has a trade in lumber and petroleum and sugar, beer, spirits and tobacco are manufactured. Pop. about 20,000.

VASARI, vä-sä'rē, **Giorgio,** Italian painter, architect and art writer: b. Arezzo, Tuscany, 30 July 1511; d. Florence, 27 June 1574. He studied under Luca Signorelli, Michelangelo and Andrea del Sarto. The Cardinal Ippolito de Medici, Pope Clement VII and the Dukes Alessandro and Cosmo of Florence, successively engaged him in their service. As an architect he showed great ability, and two of his designs, that of the Palazzo degli Uffizi at Florence and that of the church of Abbadia at Arezzo, are among the best of his time. As a painter he was less successful. His principal paintings are a 'Lord's Supper,' in the cathedral of Arezzo, and several works in the Palazzo Vecchio in Florence and in the Vatican in Rome. He has himself given us an account of his different works in Florence, Arezzo, Pisa, Venice, Bologna, Rome, etc. They exhibit all the faults of the late Florentine style. His work on the 'Vite de' più eccellenti Pittori, Scultori ed Architetti' ('Lives of Painters, Sculptors and Architects') is of great value. He, however, fell into many errors respecting the earlier masters, owing to the imperfection of existing accounts, and he has also been accused of partiality toward Tuscan artists. The work was first printed in 1550 and an enlarged and improved edition appeared in 1568. The latter forms the basis of all subsequent editions, such as that of Milanesi (Florence, 8 vols., 1878). An English translation by Mrs. Foster has been published in five volumes; another is to be found in the Bohn Library, and a third, by Blashfield, was published in New York.

VASCO DA GAMA. See GAMA, VASCO DA.

VASCONCELLOS, väs-kōn-sĕl'lōs, **Antonio Augusto Teixeira de,** Portuguese author: b. Oporto, 1 Nov. 1816; d. Paris, 29 July 1878. He studied at the University of Coimbra, and in 1845 edited *Illustração.* During the insurrection of the following year he became an officer of ordnance under Sa da Bandeira and afterward prefect of Villa Real, secretary to the junta and editor of *Revolução de Setembro.* In 1850 he went to Angola and, settling afterward at Saint Paul de Loanda, was elected president of the municipal body there. Returning to Portugal he founded in 1853 a journal called *Arauto.* He fixed his residence later in Paris and established in 1858 the Iberian Society for the purpose of publishing works relating to Portugal, Spain and Brazil. Among his works are 'Carta philosophica do Estudo da Historia Portuguesa' (1840); 'Roberto Valença,' a romance (1846); 'Carta do Trafico dos Escravos na Provincia d'Angola' (1853); 'Le Portugal et la Maison de Bragance' (1859), and 'A Fundação do Monarchia Portuguesa' (1860).

VASCONCELLOS, Joaquim Antonio da Fonseca e, Portuguese critic: b. Oporto, 10 Feb. 1849. He studied at Coimbra, traveled widely on the Continent, in 1883 became professor of the German language in the Oporto Lycée and in 1884 was made also director of the museum for industry and trade. His first work was a history of Portuguese music, 'Os Musicos Portuguezes' (1870). Other works of his on the history of musical art in Portugal were 'Luiza Todi' (1873); 'Ensaio sobre o Catalogo da Livraria de Musica de El-Rei D. João IV' (1873), and 'Cartas Curiosas do Abbade Antonio da Costa' (1879). On the graphic arts he wrote 'Reforma do Ensino de Bellas Artes' (1877–79); 'Albrecht Dürer e a sua Influencia na Peninsula' (1877); 'Francisco de Hollanda' (1879) and 'Goësiana' (1879–81).

VASCONCELLOS, Simão, Portuguese missionary and historian: b. Coimbra, 1599; d. São Paulo province, Brazil, about 1670. A member of the Jesuit order, he was sent to Brazil about 1630 and remained connected with the missions there. He wrote a 'Cronica da Companhia de Jesus no Brazil' (1663; 2d ed., 1864), a 'Vida de João Almeyda' (1665) and 'Vida de Jose Anchieta' (1666). These works are regarded as important sources for both the secular and the ecclesiastical history of early Brazil. Some of Vasconcellos' unpublished manuscripts are in the government archives of Brazil.

VASCULAR ANATOMY OF PLANTS. See PLANTS, VASCULAR ANATOMY OF.

VASELINE, a trade name for a familiar brand of petrolatum or petroleum jelly, a useful product obtained by elaborate system of filtration from crude petroleum. It is a pale-yellow, translucent, slightly fluorescent, semi-solid, insoluble in water, slightly so in alcohol, freely in ether and may be mixed in any proportion with fixed and volatile oils. This substance, of American introduction, has since 1876 become of considerable importance, having been found an excellent substitute for lard in the preparation of ointments — its quality of never getting rancid giving it a decided value in all medical preparations over the animal fats — and it seems to furnish a good basis for soaps, pomades, cold-creams, etc., thus disputing the virtues of glycerine as an emollient. Taken internally it is said to be of efficiency in the cure of coughs, colds, hoarseness and irritation of the throat. It is extensively used in hospitals as a remedy for burns and scalds, to prevent pitting in smallpox and for every kind of skin disease, inflammation and irritation.

VASES, vāz'ĕs, decorative vessels of various shapes and materials, generally with one or more handles and variously embellished and ornamented by means of relief work, incising, pigments or otherwise, and used for many purposes. The vase form usually consists of the following parts or members: rim, neck, shoulder, body or belly, stem and foot, any part of which, however, may be absent. Attachments to vases are handles and covers. Vases without feet are

known as *apode* vases. Vase body forms are: spherical, cylindrical, oviform, pear-shaped (piriform), hemispherical, etc. Vases used by the ancients as receptacles for human ashes when the bodies of the dead were disposed of by cremation and known generally as "cinerary vases" are usually classified as *urns*. The ancient Egyptians used a peculiar form of vases in their funeral ritual; they are known as *canopic* vases because manufactured at Canopus (now Aboukir). They are found composed of clay, alabaster, limestone, etc. The early ones had flat lids (5th and 6th dynasties), but later the lids assumed the form of human and animal heads. These canopic vases are in sets of four and are dedicated to the Four Children of the god Horus, namely, Tuamut (jackal-headed); Qebhsennuf (hawk-headed); Mestha (man-headed); Harpe (dog-headed). They were placed at the four corners of the sarcophagus and protected the viscera of the embalmed apportioned as follows: Heart and lungs; liver and gall; stomach; intestines, dedicated respectively to the above deities. The Etruscans adopted these canopic vases but attempted to fashion the lids as a likeness of the deceased. The Greeks and Romans dedicated certain fancifully-made vases to the gods in their temples—these are known as *ex-voto* vases. The ancient Greeks and Romans made drinking vases out of rock crystal and other semi-precious stones which they termed *diatreta* because the outside ornament was pierced and reticulated, in order, it is said, to enable the drinker to handle a cool outer surface while the contents were hot. Very interesting examples of such are extant. Greatly admired by the Romans were the *murrhine* vases for which they paid their weight in gold; they were so-called from the substance of which they were made (an Oriental precious mineral termed *murra*) and of which we have a very indistinct knowledge. Nero paid for his cup of *murra*, with a handle, over $50,000. A flourishing industry in vase production was carried on by the Romans about the 1st century A.D. at Arretium (present Arrezzo); these Arretine clay vases with their red varnish found much appreciation in their day. But the most wonderful vases dating from classical times in our possession are, probably, the *Barbarini*-glass vase (see PORTLAND VASE) with its variegated layers beautifully worked into cameo carving; the vases in the excavated silver "treasure of Hildesheim" and the "treasure of Bernay" (see SILVER-WARE) with their beautifully executed repoussé ornament; the Orsini coupe, etc. In the catacombs of the early Christian era are found small glass vases containing a red sediment, which analysis proves to be blood, and canonically pronounced by the Roman Church to be that of the early Christian martyrs in whose tombs they have been found. They are known as *sanguinolentæ*. From the 16th century we come across beautifully turned and decorated vases of rock crystal; noted Italian artists doing such work are Valerio Vicentino, Jacopo de Trezzo and the Misseronis. Vying in renown for vase making with the classic Greeks were the Chinese with their fictile vases. Their forms are equally numerous, chiefly rectangular, octagonal, hexagonal, cylindrical, and those known to the auctioneer as single, double and treble *gourd* shape, *beaker* form, *baluster* form, *lance* shape, *gallipot* form. The *inverted-pear* form was a favorite with the Celestials. Lovely vase forms as well as odd were produced in bronze by the Chinese; many decorated beautifully with cloisonné enamel, etc., are of very distant date and fetch great prices. Other wonderful vase makers of the Orient are the Indians and Persians with their slender, long-necked bottle forms done in lovely intricate arabesque damascening in silver, gold, etc. Coming back to Europe we find fictile vases of artistic form and decoration of great originality in the earthenware of the Moors of Spain, the most noted being the great lustred "Alhambra" vase with its quaint flat wing handles and decoration in Arab script and painted polychrome enamel. Other quaint vase forms are found in the German Siegburg (16th century) stoneware, such as the Ringkrüge (annular vases) with the open centre leaving only a circle of hollow pottery to serve as a body; the *Eulen* (candelabra vases) utilizing the arms and mouth for candle sockets. Coming to the 18th century we find true originality and oddity in the Sèvres *vaisseau à mât* (masted vessel) a vase consisting of a conventionalized hull, mast and rigging. Vases in precious metals entering into the ecclesiastical service of the altar are the *ciborium* and the *ostensorium*. (See ECCLESIASTICAL ART). Perhaps the strangest use to which vases have been put is found in the "acoustic" vases found in the walls of the old Roman theatres and public halls, which are supposed to give the room better acoustic (or hearing) value. See GREEK VASES; CERAMICS; CHINESE CERAMICS; PORCELAIN, etc.

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CLEMENT W. COUMBE.

VASEY, vā'sĭ, George, American botanist: b. near Scarborough, Yorkshire, England, 28 Feb. 1822; d. Washington, D. C., 4 March 1893. He was brought to this country in infancy by his parents, studied medicine at the Berkshire Medical Institute, Pittsfield, Mass, and practised his profession in Elgin and Ringwood, Ill., 1848–66. He was the botanist of the Powell Colorado Exposition in 1868 and of the Department of Agriculture at Washington from 1873 till his death. He gave his attention in his latest years almost entirely to the study of grasses, to which his publications chiefly relate. Among them are 'A Catalogue of the Forest Trees of the

United States' (1876); 'Agricultural Grasses of the United States' (1884); 'Grasses of the Southwest' (1890-91); 'Grasses of the Pacific Slope' (1892-93).

VASHEGYITE, a native aluminum phosphate occurring near Manhattan, Nev. It is white, massive, compact and has composition $4Al_2O_3P_2O_5 30H_2O$.

VASQUEZ DE CORONADO, vās-kĕth' dā kō-rō-nä'dō, **Francisco.** See CORONADO, FRANCISCO VASQUEZ DE.

VASQUEZ DE CORONADO, Juan, Spanish administrator: b. Salamanca, Spain, about 1525; d. at sea, October 1565. He came of a distinguished family, was educated at the University of Salamanca and in 1550 went to Guatemala. He was employed in various important government posts at San Salvador, Honduras, Nicaragua and Guatemala, and in 1562 was appointed *alcalde ordinario* of the provinces of Cartago and Costa Rica. His administration was noteworthy for its many admirable results. He procured provisions for needy settlers, brought order out of chaos in governmental affairs, made friendly advances to the Indians, whose goodwill he won by his unvarying kindness and impartiality, explored Costa Rica, founded several towns, including Cartago, and in 1564 returned to Spain, leaving the colony in a most satisfactory condition. In recognition of his services he was appointed captain-general of Costa Rica, the office to remain hereditary in his family, and was also made governor of Nicaragua for three years. He sailed with a large following in 1565, but met with shipwreck and was drowned in October of that year.

VASSALBORO, vās'ăl-bŭr-ō, Me., town on the Kennebec River and on the Maine Central Railroad, 11 miles northeast of Augusta. It was settled in 1760 and in 1771 was incorporated. In 1792 a part of the town was taken for the town of Sidney. There are six villages in the town. The chief manufacturing establishments are flour mills, machine shops and creameries. There are nine churches. The educational institutions are Oak Grove Seminary, public schools, a business college and a school library. Pop. 2,077.

VASSAR, John Ellison, American lay preacher: b. Poughkeepsie, N. Y., 13 Jan. 1813; d. there, 6 Dec. 1878. Employed at the outset in his brother's brewery his convictions led him to leave the service and devote his time to the good of others. He was employed by the American Tract Society (1850) in mission work and during the Civil War was engaged among the soldiers. He was familiarly known as "Uncle John Vassar." His last work was done in the South. 'Consult Vassar, T. E., 'Uncle John Vassar' (New York 1879).

VASSAR, vās'ar, **Matthew,** American philanthropist: b. East Dereham, Norfolk, England, 29 April 1792; d. Poughkeepsie, N. Y., 23 June 1868. He came with his father to this country in 1796 and settling near Poughkeepsie the elder Vassar established there a brewery, which was burned in 1811. Matthew Vassar then established himself in the same business and in time accumulated a large fortune. In February 1861 he delivered to trustees previously appointed for the purpose by the State legislature the sum of $428,000 for the founding of Vassar College (q.v.). Consult Lossing, 'Vassar College and its Founder' (1867).

VASSAR, Matthew, Jr., American philanthropist, nephew of the preceding: b. Poughkeepsie, 11 May 1809; d. there, 10 Aug. 1881. With his brother, J. G. Vassar, he built the Vassar Brothers Laboratory for Vassar College, and he also erected the Vassar Home for Old Men at Poughkeepsie. He managed the family brewery business for many years and among his many benevolent bequests were the sum of $130,000 for Vassar College and $85,000 for the Vassar Brothers' Hospital at Poughkeepsie.

VASSAR, Mich., village in Tuscola County, on the Cass River, and on the Michigan Central and the Flint and Pere Marquette railroads, about 75 miles north by west of Detroit and 25 miles southeast of Bay City. It is in an agricultural region and has considerable manufacturing interest connected with lumbering. The chief manufacturing establishments are lumber mills, flour mills, machine shops, woolen mills, creameries and foundries. It has two banks and a newspaper. The educational institutions are a high school, graded schools and school library. Pop. 1,900.

VASSAR COLLEGE, Poughkeepsie, N. Y., a college for women founded in 1861 by Matthew Vassar. His original gift to the college was 200 acres of land and $428,000; this was increased by his bequest of $360,000. It was incorporated as Vassar Female College in 1861, the present corporate name being adopted in 1867. The original endowment has been increased by other members of the Vassar family and later by gifts from friends of the college in various parts of the United States, until the endowment on 1 July 1918, including fellowships and scholarships, amounted to $2,707,075.07, with 800 acres in campus and farm. Student enrolment is limited to 1,000, who may be housed on the campus; but the pressure for admittance and the difficulty of estimating withdrawals make it impossible to maintain this limit with exactness and the enrolment for 1917-18 numbered 1,125. Students are admitted on passing the examinations set by the college entrance examination board, or by an examination covering three years of preparation in four selected subjects; this latter method takes the place of entrance by certificate from approved schools. The course of study, which is partly elective, covers four years and leads to the A.B. degree. The degree of M.A. is also conferred in course. Five fellowships for graduate work are offered and a large number of undergraduate scholarships. The funds available for student aid in one form or another amounted in 1918 to $434,955.59. The affairs of the college are administered by a board of 27 trustees, a president, a treasurer and a faculty composed in 1918 of 140 members. The physical equipment of the college, exclusive of faculty residences, includes 27 buildings, seven of them dormitories, which are also residence halls; a farm of 675 acres, maintaining vegetable gardens and a model dairy, operated for the benefit of the college dining-rooms; an open-air theatre, athletic grounds, flower gardens and conservatories, lakes and woodland. Among the more notable buildings are the Main Building, one of the three edifices that constituted

the college in 1865, containing administrative offices and accommodations for about 400 students and officers; the College Chapel, a stone building in Norman style, with a seating capacity of 1,400, containing a set of chimes and stained glass windows by John LaFarge, the Tiffany studios and the Dodge studio; the Frederick Ferris Thompson Memorial Library, of stone, in perpendicular Gothic style, providing space for 160,000 books and about 600 readers and containing, in 1918, 100,000 catalogued books and pamphlets; Rockefeller Hall, a modern structure for recitations and lectures, at the end of the dormitory quadrangle; a Museum building containing excellent collections of minerals and fossils and nearly 3,000 mounted birds, as well as many other collections; Taylor Hall, containing the valuable art collections of the college and art lecture halls and studios; the Swift Memorial Infirmary, containing a modern hospital equipment; Metcalf House, a health cottage adapted for convalescents and rest cases; the Students' Building, providing for the needs of the Students' Association and other college organizations, with a large auditorium, seating 1,500, equipped with a modern stage and scenery; and the Good Fellowship Club House, erected by the Students' Association for the maids employed in the college and devoted to social welfare work. Student self-government is in effective operation, the students themselves assuming responsibility for most of the regulations governing conduct and for the management of such property as the Students' Building and the Good Fellowship Club House and for all extra-curriculum activities, including the providing of various money-making occupations for self-supporting students. The facts that the price for rooms and board is the same for every student, the rooms being selected by lot, that there are no sororities or other clubs to which membership is not absolutely open and that no admission fee may be charged to any campus meeting, all help to maintain the fine democratic spirit that prevails. The college is distinctly Christian, but undenominational in its management. Services on Sunday are conducted by visiting clergymen of various churches and evening prayer is held in the chapel daily. The social life of the student body is under the direction of a department of wardens; one warden resides in each house and has charge of its social interests. This department directs also an occupation bureau for the aid of students and for alumnæ desiring to register for positions. The health and physical training of the students are made a chief object of attention and are under the direction of a resident physician and two assistant physicians, who also control the sanitary regulations of the college.

VATHEK. This wonderful tale of the East has a curious history. It was written by William Beckford, when a young man, at the suggestion of the Rev. Samuel Henley, then an assistant master at Harrow, one of the great public schools of England. There is a tradition that Beckford wrote it out in three days and two nights, never leaving his room or taking off his clothes in the meantime. The correspondence between Beckford and Henley, however, shows that the author was engaged upon the book for several years. As a boy Beckford was fascinated by 'The Arabian Nights,' and subsequently read several learned books upon Mohammedan life, customs and beliefs. In a word, all the details of his story were closely studied. Rather capriciously, he composed the tale in French and gave Henley a copy of his manuscript to translate into English. Owing to a misunderstanding between author and translator, the English version was published first. It appeared in the summer of 1786, with a preface and notes by Henley, who suppressed the author's name and claimed that the tale was translated directly from the Arabic. At this treatment by his translator Beckford was very angry and the next year he published the original French at Lausanne (where he was staying) and at Paris. Three subordinate tales which were to form a part of 'Vathek' were not published until the 20th century. In their complete form, both French and English, they may now be read in 'The Episodes of Vathek,' translated by Sir Frank T. Marzials, with an introduction by Lewis Melville (London 1912). But the 'Vathek' whom countless readers know, the romance which Byron often praised and rated far above Dr. Johnson's 'Rasselas,' is Henley's version, one of the best translations ever made of a foreign classic. So natural, flexible and idiomatic is the style that the book reads as if it were originally composed in English.

'The History of the Caliph Vathek' is a story of mingled horror, burlesque and sublimity, varied by scenes of great beauty; and the whole is organized as a study in retribution. Vathek, a grandson of Haroun-al-Raschid, rules the Mohammedan world from his splendid palace overlooking the Babylonian city of Samarah. When we first see him he is a young monarch indulging himself in all the sensual delights of exquisite dishes, voluptuous music, delirious perfumes and troops of girls as beautiful as the houris. He has an eye so terrible that any wretch who looks upon its steadfast gaze falls to the ground and sometimes expires. He grows cruel; he imprisons on whimsical charges his most faithful subjects and in general administers justice in a most haphazard manner. He comes under the influence of Carathis, his mother, magician and necromancer in league with the most malignant spirits, with ghouls even, whom she summons from the grave to do her bidding. She is surrounded by negresses with one eye, who aid her in her wicked designs; and she is so ceaseless in the pursuit of the powers of darkness that she would never sleep but for the visions of evil that then come to her. Instigated by this mother, Vathek commits the most heinous crimes. In defiance of Mohammed and Allah, he erects a lofty tower of 11,000 stairs in a vain endeavor to penetrate, by the most obscene rites, the mysteries of heaven. At length he abjures his religion and sells his soul to Eblis, the Mohammedan Satan, in the hope of obtaining the throne of the pre-Adamite sultans.

The agent of the transaction is a giaour, who appears in the form of a man so hideous that people shut their eyes at the first sight of him. Vathek, in one of his fits of madness, kicks him down the palace steps; other feet join in the entertainment and the intruder is kicked through the palace and streets of Samarah. The giaour nevertheless wins over

Vathek, who obtains for his harem Nouronihar, the most beautiful and sensuous of Oriental women. The last scene is in the magnificent hall of Eblis, where, disappointed of all their hopes, Vathek and Nouronihar and Carathis are consigned to eternal pain. With right hands upon hearts kindled by Eblis into flames, they must there tread a never-ending round of agony. No neater punishment was ever devised for the damned. Nor were there ever any better pieces of extravagance than the sport which Samarab has with the giaour, or the tricks which Nouronihar and the girls of the harem play upon Bababalouk, the chief of the eunuchs.

WILBUR L. CROSS.

VATICAN, The, a palace situated on the eastern sections of the Vatican Hill in Rome, the principal residence of the popes since the return from Avignon in 1377 and their official residence since the capture of Rome by the Piedmontese in 1870. It originated in a residence built by Pope Symmachus (498–514) adjoining the Basilica of Saint Peter, but was rebuilt and greatly enlarged by subsequent popes, especially Nicholas V, Sixtus IV, Alexander VI and Julius II. The Basilica and Piazza of Saint Peter flank it on the south, while to the west lie the Vatican Gardens. Only a small part of the Vatican is residential and this part is around the Cortile di San Damaso; all the rest is used for scientific or administrative purposes. There are a large number of chapels which serve various purposes, the most important being the famous Sistine Chapel and the Cappella Paolina. The rear wall of the former contains Michelangelo's 'Last Judgment,' while its side walls contain frescoes executed by Florentine and Umbrian masters between 1481 and 1483. The Cappella Paolina, which is separated from the Sistine Chapel only by the Sala Regia, serves as the parish church of the Vatican.

The Vatican contains many works of art either in its museums and collections or as a part of its interior decorations. The Museo Pio-Clementino embraces 11 separate rooms and among its treasures are the Torso of Hercules, the Belvedere Apollo and the Laocoon. In the Galleria Chiaramonti there are more than 300 sculptures, chiefly the work of Greek sculptors living in Rome. From an architectonic point of view, the Braccio Nuovo, containing statues and busts, is the best of the museum buildings. The Egyptian Museum, embracing 10 halls full of statues, sarcophagi, mummies, etc., is among the first of Egyptian collections of the second rank. The Etruscan Museum contains objects of almost every description, giving a highly graphic picture of the art of ancient Italy and the customs of the Etruscans. These two museums are located, one below the other, at the northern end of the Giardino della Pigna.

Besides these museums, there are several galleries of paintings. The Vatican Pinacotheca, whose nucleus was the collection of art treasures taken by Napoleon to Paris and subsequently restored to Rome, contains works by Raphael, Leonardo da Vinci, Fra Angelico, Murillo, Perugino, Titian, Pinturicchio, Guido Reni, Correggio and many other Italian masters; while the Gallery of Modern Paintings contains, among others, the huge picture of the promulgation of the Immaculate Conception by Pius IX. The Appartamento Borgia consists of six rooms adorned with Pinturicchio's paintings. In the second of the rooms the mysteries of the life of Christ are depicted. The last two rooms are situated in the Torre Borgia. One of these formerly contained the celebrated Nozze Aldobrandini, one of the finest antique frescoes surviving from classical times, which is now located in the Vatican Library.

One floor higher and an exact reproduction of the Appartamento Borgia in size and shape are the Stanze di Raffaello, so called because they were painted by or under the direction of Raphael. Immediately adjacent to the Stanze are the Loggie di Raffaello, while underneath the latter are the Loggie di Giovanni da Udine, a pupil of the Umbrian master. In the Galleria degli Arazzi hang the famous 27 pieces of tapestry. The studio for mosaic painting, for which the Vatican is justly famous, is said to possess nearly 30,000 different shades of vitreous compostion.

The scientific materials in the Vatican are abundant and easily accessible to research workers under certain restrictions. Reference is facilitated by a great many volumes (some printed, some in manuscript) of indices, inventories and catalogues, so that information on all branches of human knowledge may be readily secured in the Vatican Archives and Library. The scientific management of the Vatican Archives is entrusted to a cardinal and the chief groups of archival materials are the Archivio Segreto, the Archive of Avignon, the Archive of the Apostolic Chamber, the Archive of Sant' Angelo, the Archive of the Dataria, the Consistorial Archive and the Archive of the Secretariate of State. The last named contains the correspondence of the nunciatures, legations, cardinals, bishops, prelates, princes, titled persons, military men and others. Besides these archives there are various collections, including the huge archive of the old Congregation del Buon Governo, which was entrusted with the economic administration of the Papal States from 1592. The entire collection of archives is of the greatest importance for the political and ecclesiastico-civil history of modern times, and is of especial interest to Americans because it abounds in materials for American history, particularly of the period of colonization. Consult Fish, C. R., 'Guide to the Materials for History in Roman and Other Italian Archives' (Washington 1911).

In the importance of its materials the Vatican Library stands first among the great libraries of the world, containing approximately 50,000 manuscripts and 350,000 printed books. Because it is primarily a manuscript library and because its accommodations are inadequate to meet the demands of the general public, all readers who wish to consult only printed literature are excluded from the library. The manuscripts are divided into 16 open divisions, or divisions subject to later accessions, and 36 closed divisions, or divisions which came to the library complete, and are separated according to the language of the manuscript. Here are to be found the majority of the manuscripts, from the convent at Bobbio, in the Middle

Ages one of the richest collections in Europe. Here also are 3,000 manuscripts, brought to the Vatican from Heidelberg in 1623 and called "Codices Palatini." The last great addition was in 1856, when Pope Pius IX added 40,000 volumes that had belonged to Cardinal Mai, the discoverer of the lost manuscript of Cicero's 'De Republica.'

The scientific management of the Vatican Library is entrusted to a prefect, who also has charge of a Pagan Museum, a Numismatic Collection and the Museo Cristiano. The last-named was separated for a time from the library management when the celebrated De Rossi was named prefect of the Museo, an honor intended only for him. Despite the small staff of the Library and its insufficient funds, it stands at the head of the libraries of the world in the number of its scientific publications.

Besides the Archives and the Library the Vatican possesses an astronomical observatory, a modern polyglot printing office, a collection of inscriptions and a collection of geographical charts. The Specola Vaticana consists of the Gregorian Tower and the Leonine Tower with a connecting passageway and has acquired considerable reputation for its measurement of astrographic plates. The Galleria Lapidaria contains no less than 6,000 inscriptions in stone and numerous other inscriptional remains. Closely identified with it was the celebrated Marini, one of the founders of Latin epigraphy.

There are several large state halls in the Vatican, including the Sala Regia (where the consistories are held), the Sala Ducale and the Sala Clementina, which are of great historical importance. The neighboring Basilica of Saint Peter is regarded as a part of the Vatican only when the Pope attends some solemn ceremony there. Since 1870 the Vatican has been considered extraterritorial and has consequently possessed its own military guardians, the Swiss Guards, and its own police, the gendarmes; before that time it came under the civil administration of the Papal States.

The importance of the Vatican, the administrative centre of the Catholic Church, was increased by the seizure of the Papal States and the consequent exclusive residence of the Pope in the Vatican. Business formerly transacted elsewhere, for instance, in the Lateran Palace, is now conducted here. It was here that the conclaves were held which elected Leo XIII, Pius X and Benedict XV to the papacy. It is here that the Papal Secretary of State receives the ambassadors and envoys accredited to the Holy See, so that all diplomatic affairs not transacted by correspondence are conducted in the Vatican. A number of the important Roman Congregations hold regular or special sessions in the Vatican. This concentration of administrative affairs in the Vatican inevitably follows the residence of the Pope there.

Bibliography.— Gregorovius, 'History of Rome in the Middle Ages' (English translation by Mrs. G. W. Hamilton); Pistolesi, 'Il Vaticano descritto ed illustrato,' noted for its profuse illustrations; Sladen, 'How to See the Vatican,' one of the best modern works in English; Potter, 'The Art of the Vatican'; Murray, 'Handbook to Rome'; Baumgarten, 'Vatican,' in 'The Catholic Encyclopedia'; Kuhn, 'Roma.'

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VATICAN COUNCIL, or COUNCIL OF THE VATICAN, the only plenary council of the Roman Catholic Church held since the Council of Trent in 1563. In June 1867 Cardinal Caterine sent a circular letter to the 500 bishops present in Rome at the celebration of the 18th centenary of the martyrdom of Saints Peter and Paul, inviting their replies relative to questions on points of discipline and other matters to be brought up in the proposed council. In September 1868 an invitation to attend the approaching Council was sent to Oriental bishops not in communion with the Roman Catholic Church, and to "Protestants and non-Catholics." The bull of convocation was promulgated on 29 June 1869, appointing 8 Dec. 1869, as the day of meeting. A few days before the latter date, on 27 November, Pius IX issued the brief, *Multiplices inter,* prescribing the mode of conciliar procedure.

The Council, which assembled on the appointed day, 8 Dec. 1869, was the largest ever held, 749 cardinals, bishops, abbots and generals of religious orders being present, or nearly three-fourths of the Roman Catholic episcopate. The number was afterward increased to 764. The invitation to non-Catholics and others not in communion with Rome brought no response in the form of attendance. The Italian bishops numbered 170 and the Spaniards 40. On 10 December, at the first congregation of the Council, a bull was published decreeing that if the Pope should die during the Council, that body should at once be prorogued, and take no part in the election of a pontiff, which duty was to rest with the College of Cardinals. Petitions were signed by many prelates, members of religious orders and lay Catholics, asking for the definition by the Council of the dogma of papal infallibility.

At the second session, 6 Jan. 1870, all the members present recited the Creed of Pius IV pledging loyal obedience to the Roman Pontiff, and took the episcopal oath. The Cardinals-president of the congregation, on 20 February, issued rules which should govern the debates of the Council, and the "Constitution on the Faith," known as *Dei Filius,* was formulated and adopted. It is chiefly directed against modern rationalism. All the 667 members present signed this Constitution, and it was promulgated at the third session, 24 April 1870, with papal confirmation.

Next followed the most important work of the Council, a decision that should put an end to all discussion on the subject of papal infallibility, already accepted as a dogma by the vast majority of the Church. The Constitution now generally known as *Pastor Æternus* asserted the following propositions: (1) That a proper primacy of jurisdiction over the whole Church was conferred upon Saint Peter directly and singly, and not mediately through any delegation to him, as chief minister of the Church, of a primacy held by the Church corporately; (2) that this Petrine primacy vests only by divine institution and right in the line of Roman pontiffs; (3) that the Pope's juris-

diction is immediate in all churches—that is, he is the universal ordinary, the actual bishop of every see (all other bishops being merely his curates and deputies), and is not a remote or merely appellate authority—so that in questions not of faith and morals alone, but of discipline and government also, all the faithful, of whatever rite or dignity, both pastors and laity, are bound, individually and collectively, to submit themselves thereto; (4) that it is unlawful to appeal from the judgments of the Roman pontiffs to an œcumenical council, as though to a higher authority; and (5) that the Roman pontiff, when he speaks ex cathedra and defines a doctrine of faith or morals to be held by the universal Church, is infallible, and such definitions are accordingly irreformable of themselves, and not from the consent of the Church. This document was voted upon, 13 July 1870. Of the 671 members present 451 voted directly in the affirmative, 62 voted *placet juxta modum*, signifying approval with certain changes of expression, and 88 voted *non-placet*, but of these many objected not to the essence of the dogma, but to the time—one of great agitation in the political world—as inopportune for declaring it. After discussion the newly-defined dogma was adopted at a public session, held 18 July 1870, when 535 voted in the affirmative and only two, the bishops of Ajaccio and Little Rock, Ark., answered "non-placet," these afterward joining in unanimous adoption. The Pope confirmed the action of the Council, and on 20 Oct. 1870 the Council was formally prorogued, instead of being dissolved. It is, therefore, technically still in existence. The year in which papal infallibility was declared to be a dogma of Roman Catholic faith witnessed the downfall of the Pope's temporal power, the Italian government having taken possession of Rome, 20 Sept. 1870, and Rome being proclaimed the capital of Italy, 9 Oct. 1870. See CATHOLIC CHURCH; PAPACY, and consult Arthur, William, 'The Pope, the Kings and the People' (London 1903); Fessler, Joseph, 'Das vatikanische Concilium, dessen äussere Bedentung und innere Verlauf' (2d ed., Vienna 1871); Friedirck, J., 'Geschichte des vatikanischen Konzils' (3 vols., Bonn, 1877–87); Manning, Henry E., 'The True Story of the Vatican Council' (London 1877); and 'Acta et Decreta Concilii Vaticani' (Freiburg 1892).

VAUBAN, vō-ban, **Sebastien le Prestre**, SEIGNEUR DE, marshal of France, French military engineer: b. Saint Léger de Towcherets, near Avallon, Burgundy, 1 May 1633; d. Paris, 30 March 1707. He early entered the army, where his uncommon talents and genius for fortification soon became known, and were signally displayed in various successive sieges. He introduced the system of approach by parallels at the siege of Maestricht (1673), and distinguished himself at Oudenarde, Valenciennes and Cambrai. He rose to the highest military rank by his merit and services, and was made governor of the citadel of Lille in 1668 and commissioner-general of fortifications in 1677. He was made marshal of France in 1703. As an engineer he carried the art of fortifying, attacking and defending towns to a degree of perfection unknown before his time. He fortified above 300 ancient citadels, erected 33 new ones and had the principal management and direction of 53 sieges. Among the principal places fortified by him are the port of Dunkirk and the citadels of Lille, Metz and Strassburg. He was the inventor of the socket bayonet and ricochet batteries.

VAUCLUSE, France, a department in the southeast of the republic, famous for its wines and silks; paper and chemicals are also manufactured. The chief towns are Avignon (q.v.), Apt, Carpentras, Orange and Vaisou. The climate is mild and delightful. Pop. (1918 est.) 250,000.

VAUDEVILLE, a form of dramatic representation in which songs and dances are interspersed with dialogue. The name is a corruption of the French Vau de Vire, a picturesque locality in Normandy, where a number of popular humorous songs were written in the 15th century. Consult Gasti, 'Les vaux de vire de Jean le Haux' (Paris 1875).

VAUDREUIL DE CAVAGNAL, Pierre François de Rigaud, MARQUIS DE, French soldier and colonial administrator: b. 1704; d. 1772. As an officer of the French colonial army in New France (Canada) he came into prominence in 1746, when with French and Indian troops he captured Fort Massachusetts, at North Adams, Berkshire County, Mass., the site and ruins of which are among the city's historical features. Later he was appointed governor and lieutenant-general for the king of New France and of the territory of Louisiana. Consult 'Letters du Marquis de Vaudreuil au Chévalier de Lévis, 1756–1760' (Quebec 1895).

VAUGHAN, Bernard, English Catholic priest: b. Herefordshire, 20 Aug. 1847. He was educated at Stonyhurst, became a member of the Society of Jesus and for years played a conspicuous part in the life of Manchester. In 1901 he went to London to work among the poor of the East End and organized bazaars for the erection of clubs for the working classes. In 1906 he drew large audiences by a series of sermons on the "Sins of Society" which was followed (1907) by a Lenten course on the "Sins of Society gauged by the Passion of Christ." In 1910 he toured the United States, Canada and Alaska and went to Japan where he lectured before the Imperial University of Tokio and addressed the House of Peers and ladies of society. He also lectured in China and in Italy and France. He was chosen English preacher at the Marian Congress in Rome (1894) and preached before King Edward VII when Prince of Wales (1902). He became chaplain to the Catholic troops of the British expeditionary forces in France during the late war. His publications include 'The Roman Claims'; 'Faith and Reason'; 'The Tripple Alliance'; 'The Demon of Drink in The Temple of God'; 'The Sins of Society' (1906); 'Society, Sin and the Savior' (1907); 'Life Lessons from Joan of Arc, the Matchless Maid' (1910); 'Socialism' (1910); 'The Our Father Our Country's need to-day' (1911); 'Socialism from the Christian Standpoint' (1913); 'The Menace of the Empty Cradle' (1917); 'The Worker's Right to Live' (1918).

VAUGHAN, vân or vâ'an, **Charles John**, English Anglican clergyman: b. Leicester, 1816; d. Llandaff, Wales, 15 Oct. 1897. He was edu-

cated under Arnold at Rugby, and at Trinity College, Cambridge, took holy orders in 1841, and was successively vicar of Saint Martins, Leicester (1841–44), head-master of Harrow (1844–59), vicar of Doncaster (1860–69), master of the Temple (1869–94) and dean of Llandaff from 1879. While at Harrow he did much toward increasing the efficiency of that school, and as master of the Temple became known for pulpit eloquence and was conspicuous as one of the leaders of the Broad Church party. He married a sister of Dean A. P. Stanley (q.v.). Among his 40 or more published volumes are 'Harrow'; 'Temple'; and 'University Sermons'; 'Commentaries on Acts, Revelations, Philippians'; 'Family Prayers'; 'Discourses on Liturgy and Worship'; 'Addresses to Young Clergymen'; 'The School of Life.'

VAUGHAN, George Tully, American surgeon: b. Arrington, Nelson County, Va., 27 June 1859. He was educated at the Kenmore University High School, Amherst, Va. (1867–68); he then graduated with the degree of M.D. from the University of Virginia, and from Bellevue Hospital Medical College, New York, after which he took post-graduate courses in the New York Polyclinic, the University of Berlin, Germany, and the Jefferson Medical College, Philadelphia. He was appointed assistant surgeon in the United States Marine Hospital Service in 1888; surgeon in 1900 and assistant surgeon-general in 1902. During the war with Spain he served as major and brigade surgeon of the Seventh army corps. Since 1897 he has been professor of surgery in Georgetown University, Washington; surgeon to Georgetown University, Emergency and Saint Elizabeth hospitals; and from 1902 has been assistant surgeon of the United States Public Health and Marine Hospital Service. He has written 'Principles and Practice of Surgery' (1903).

VAUGHAN, Henry, Welsh poet: b. Newton, parish of Llansaintfraed, Brecknockshire, 17 April 1622; d. there, 23 April 1695. He was styled "The Silurist," because his native region was among the Silures, or folk of South Wales. He was educated at Jesus College, Oxford, and practised medicine with much success and reputation first at Brecknock and later at Newton. He was imprisoned for his loyalty at the Revolution, and he was present at the battle of Rowton Heath — as surgeon with the royalist army. His first volume was 'Poems with the Tenth Satyre of Juvenal Englished' — a free rendering (1646); followed by 'Olor Iscanus' — 'Swan of the Usk' (1651), the chief portion of the volume being a eulogy of that river. Thereafter his verse took on a predominantly religious and devotional cast and greatly improved in poetical quality. In 1650 appeared the first part of 'Silex Scintillians' — 'Sparks from the Flint,' described in its sub-title as made up of "sacred poems and private ejaculations," and completed in 1655 by the addition of a second part containing what are probably his best-known stanzas — "They are all gone into the world of light." One "J. W." collected (1678) various elegies, translations and other productions as 'Thalia Rediviva'; and Vaughan also published some books of prose, among them 'The Mount of Olives' (1652), a work of devotion. He abounds in occasionally felicitous phrases and lines — like, as he said, "unanticipated sparks from a flinty ground." A few of his poems have been given by critics a very high place in literature. He was practically unknown until H. F. Lyte edited the sacred poems in 1847. A complete edition of his works is that of Grosart (1871); of the poems, that of Chambers (1896). Consult the memoirs in these editions; also the essay in Brown, 'Horæ Subsecivæ' (Series I, 1858).

VAUGHAN, Herbert, English Roman Catholic prelate: b. Gloucester, 15 April 1832; d. London, 20 June 1903. He was educated at Stonyhurst College and on the Continent; was ordained to the priesthood in 1854; founded Saint Joseph's College for foreign missions at Mill Hill, Hendon; visited Maryland as a missionary to the negroes; and in 1872 was consecrated bishop of Salford. On Manning's death he was appointed (1892) archbishop of Westminster, and shortly afterward was made cardinal. He was a preacher of much eloquence, and proprietor of the *Dublin Review* and the *Tablet*. He displayed a marked interest in the temperance cause and in commercial education among Roman Catholics, building for this latter purpose Saint Bede's College.

VAUGHAN, John Stephen, English Catholic bishop, brother of Bernard and Herbert Vaughan (qq.v.): b. Courtfield, 24 Jan. 1853. He was educated at Saint Gregory's College, at the Collegio Inglese, Rome, and at the Grand Seminaire, Bruges. He became a priest in 1876, sailed to Australia where he did missionary work for three years, then returned to London where he took up parochial tasks. He was canon of Westminster (1898), delivered free Catholic lectures in the public halls of London (1890–93), resided in Rome as domestic prelate (1904–07) and then went on a lecture tour to the United States and in 1909 was created bishop of Manchester. While working in London, in addition to preaching he gave spiritual retreats to seminarists and to the clergy both in England and Ireland and in the United States. His writings are various and have been translated into several languages. They include 'Life after death'; 'Thoughts for all times'; 'Faith and folly'; 'Concerning the Holy Bible'; 'Dangers of the Day'; 'The Purpose of the Papacy'; 'Happiness and beauty'; and 'Time or Eternity.'

VAUGHAN, Robert, English clergyman and historian: b. 1795; d. Torquay, 15 June 1868. He was professor of history in London University; and in 1842 became president of the Lancashire Independent College at Manchester, remaining in that position until 1857. He also founded the *British Quarterly Review* and for 20 years was its editor. Among the more important of his works are 'Life of John de Wycliffe (1828); 'The Protectorate of Cromwell' (1838); 'History of England Under the House of Stuart' (1845); 'The Age of Great Cities' (1842); 'Revolutions in English History' (1859–60).

VAUGHAN, Thomas Wayland, American geologist: b. Jonesville, Tex., 20 Sept. 1870. After graduating from Tulane University in 1889, and from Harvard University in 1893, he went to Europe, studying in the museums. He engaged in geological and palæontological researches, making a specialty of tertiary geology,

fossils and recent corals and now is connected with the United States Geological Survey. He has published 'The Eocene and Lower Oligocene Coral Faunas of the United States,' Vol. VI, Monograph XXXIX, Geological Survey, besides many papers on geology and palæontology.

VAUGHAN, Victor Clarence, American physician, scientist and educator: b. Mount Airy, Mo., 27 Oct. 1851. He was educated at Central and Mount Pleasant colleges, Missouri, and at the universities of Michigan and Berlin. He was appointed instructor in the University of Michigan in 1876, made professor in 1880 and dean of the Medical School in 1891. As an educator he developed the combined collegiate and medical course which was first formulated and given in the University of Michigan in 1890 and has since been adopted by the majority of university medical schools in the United States. He has always advocated a broad fundamental training in language, including Latin, Greek, French and German, history, mathematics and the sciences, biology, physics and chemistry; and the acquisition of professional and expert knowledge based upon these fundamentals. His research studies have been devoted largely to the chemistry of bacteria and other proteins. He has shown that all proteins, bacterial, vegetable and animal, contain within their molecular structure poisonous groups, which though similar in physiological effects differ in chemical construction. His contributions to science cover about 200 titles in American and European publications. He has been president of the Association of American Physicians and the American Medical Association, and is a member of the American Philosophical Association, the National Academy of Sciences and honorary member of the French and Hungarian Societies of Hygiene. He served as division surgeon in the Cuban campaign in 1898 and was recommended for brevet-colonel by President McKinley for behavior in the battle of Santiago. With Reed and Shakespeare he studied the causes of typhoid in the camps in 1898 and as the surviving member of this commission he wrote the report, which has been of value in eliminating this disease in armies.

VAUGHAN, Sir William, English poet and colonial planter: b. Golden Grove, Carmarthenshire, 1577; d. Torcoed, England, August 1641. He was educated at Oxford, graduated in law and in 1625 became a physician. He founded the settlement named Cambriol at Newfoundland, concerning which he wrote 'The Golden Fleece, divided into Three Parts, etc., by Orpheus Junior' (1626), a quaintly written combination of prose and verse notable as the first volume of poetry written in the North American colonies. He returned to England in 1625 and wrote 'Cambrensium Caroleia.'

VAUGHAN-HUGHES, James, English surgeon: d. November 1916, aged 95. He served as a surgeon in the Crimean War and was for a time in charge of Balaklava Hospital; he attended Florence Nightingale in a transport when she was suffering from camp fever. On her recovery he borrowed Lord Dudley's yacht to convey her back to Skutari. Later he himself contracted Asiatic cholera and was nursed by Miss Nightingale and her staff. He recorded his reminiscences in 'Seventy Years of Life in the Victorian Era.'

VAUGHT'S HILL, Engagement at. On 18 March 1863 Col. A. S. Hall, with a brigade of Union infantry of 1,300 men and two guns, was sent from Murfreesboro to look after Gen. John H. Morgan, who was raiding the country to the northeast. Beyond Statesville, Hall ran into the Confederate skirmishers, and these, being pressed back, disclosed Confederate cavalry in position. Learning also that Morgan, with a large force, was preparing to attack him, Hall fell back to Vaught's Hill, a steep cedar-wooded height, near Milton, about 13 miles from Murfreesboro. He was closely followed by Morgan with about 2,500 men and a battery of artillery, who made an attack at 11.30 A.M., on the 20th, before Hall had fairly taken position. Morgan's larger numbers permitted him to attack both Hall's flanks and rear, but he could gain no further advantage, and after an engagement of nearly four hours, in which he was several times repulsed, he finally withdrew, leaving his dead and many wounded on the field. His loss was 30 killed and 150 wounded, the loss in officers being very heavy. The Union loss was six killed, 42 wounded and eight missing. Consult 'Official Records' (Vol. XXIII).

VAULT, an arched-covered enclosure, hence frequently used to express the arched ceiling or roof, as of a hall, room, cellar or other compartment or edifice. In a still further extension the term vault is frequently used as synonymous with a subterranean compartment, as a crypt, cellar, etc. In architecture it must be noted that vaults are ceilings not roofs, as those below ground (crypts, etc.) carry the floor above and even in the case of naves and aisles of churches the vaulting may carry a solid masonry roof, as in Milan Cathedral and the Romanesque buildings of southern France. While the art of vault construction dates back to unknown origins and the Romans excelled in the art, it was in the Middle Ages that architecture took up seriously the important phase of creating its decoration in the actual construction itself, and vaulting was the greatest problem of the architect in his construction. The early Christian basilica, from its pagan prototype, had at the far end of its flat roof a half dome or demi-hemisphere (*apse*). In Romanesque architecture (say 11th century to middle 12th century) the naves and aisles of the church edifices were covered, in sequence, with the following styles of vaults: First the cupola (domical), next the tunnel vault, then the groined vault. Out of the latter developed the "ribbed," and the Gothic era in vaulting arose.

Technique.— Various authorities divide vaults into two classes as to their construction: Solid and Ribbed, and, as to form, into Simple and Compound. *Solid* are those having unbroken surfaces whereas the *ribbed* refer to those with variegated inner surface planes. *Simple* are those vaults composed of an unchanged form of archway throughout. *Compound* vaults are those broken up by intersecting arches. A *simple* vault is the cylindrical, termed *barrel, tunnel, cradle* or *wagon* vault a mere arch extended in its axis to roof over

a compartment or other space. The tunnel or barrel is the commonest in use and has usually a semi-circular cross section and the inner or "vaulting surface" (*intrados*) has the form of a portion of a hollow cylinder. (Fig. 1). Barrel

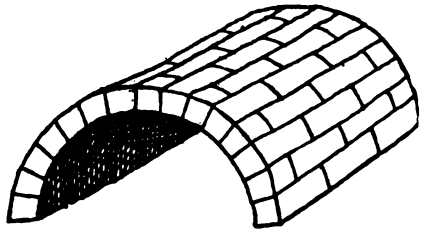


FIG. 1.— Tunnel or Barrel Vault.

vaults may, however, have cross sections semi-elliptical, segmental, pointed, three centred, etc. Barrel vaults date back at least to 800 B.C. as found in the pyramids at Meroc and at Nimroud. In the case of the aisles of church build-

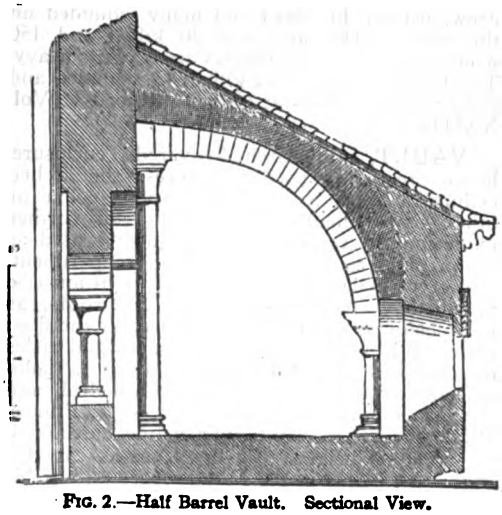


FIG. 2.—Half Barrel Vault. Sectional View.

ings a "half-barrel" vault is frequently used having a 45 degrees segment of a circle. (Fig. 2). Another simple vault is a *skew* arch which has been described as "a barrel vault whose ends are in parallel planes oblique to the axis and

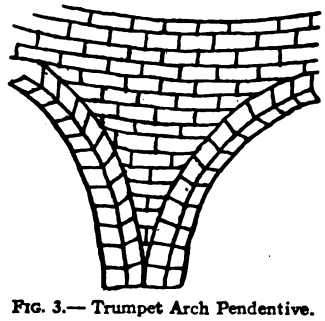


FIG. 3.— Trumpet Arch Pendentive.

whose joints are spirals." The *annular* vault also belongs to the simple series. This has its axis curved; its *intrados*, therefore, is a portion of a cylindrical or hollow ring. The *spiral* vault also belongs here, and is an *annular* vault with spiral axis; used for supporting winding stairs, etc. Still another kind belonging to this category is the *expanding* vault; these are smaller at one end than the other and the inner surface diminishing has a form of part of a truncated cone or elongated funnel. Such are found in Romanesque style buildings to form *pendentives* (Fig. 3) to assist in reducing a square to an octagon and may occur as parts of *compound* vaults. Compound vaults are, as before stated, simple vaults intersecting one another. (Fig. 4). They usually are termed *groined* vaults on account of the groin angle

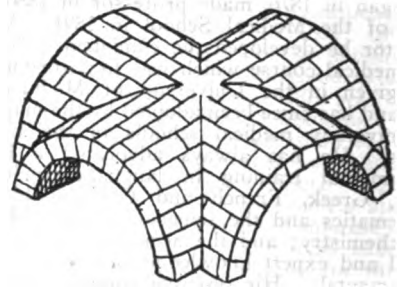


FIG. 4.— Groined Vaults.

which the two surfaces produce at their juncture. These compound vaults may be divided into: *quadripartite* (four-part), *oblique*, *irregular*, etc. The *quadripartite* form is evolved from two barrel vaults intersecting. (Fig. 4). In covering a square compartment it is the common groin vault; in *domical* vaults, it is the so-called "cloistered arch" or square dome, etc. Covering oblong compartments of such we have, among others, the "Welsh" or "underpitch" vaults (Fig. 5) with the surface parts cylindrical usually and the groin line becomes a hyperbola. In the square compartment also comes the "stilted" vault composed of cylindrical vaults but with the transverse narrower

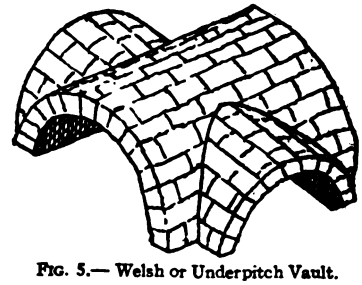
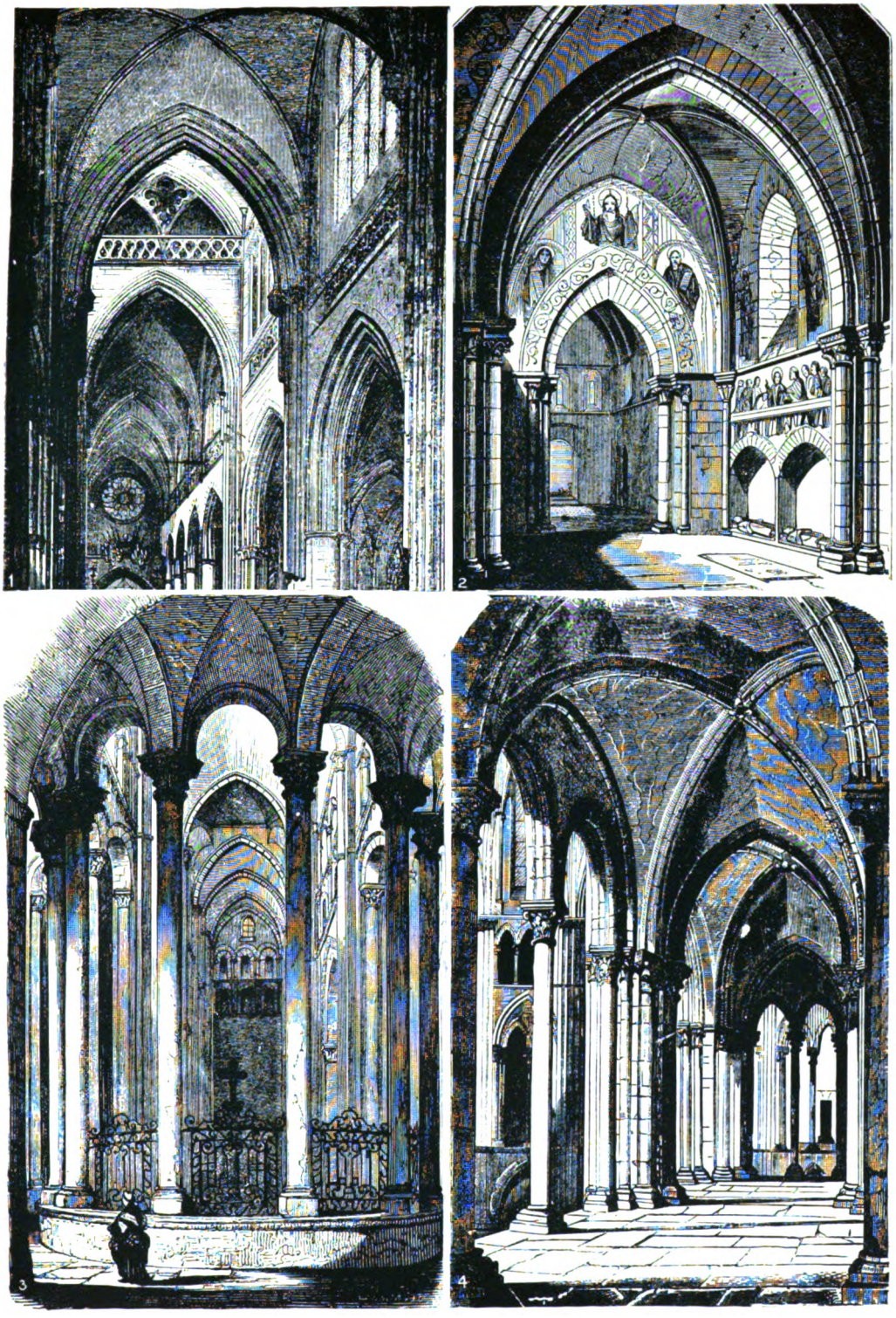


FIG. 5.— Welsh or Underpitch Vault.

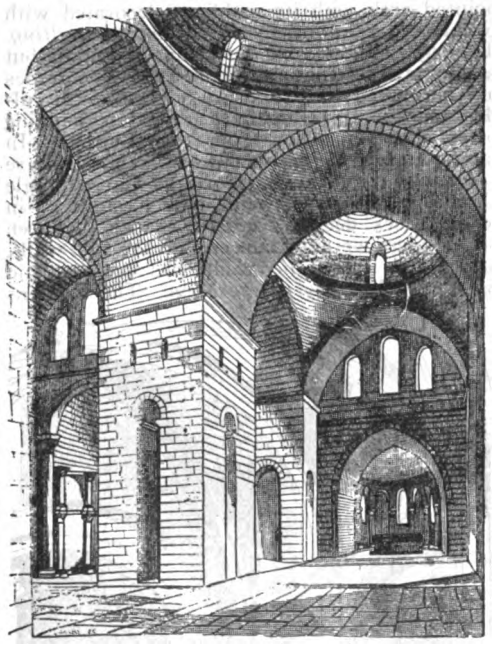
than the main and springing from a higher level, causing the groin line to assume a double curve. They are found frequently covering Roman halls and baths and appear in French Romanesque. *Oblique* vaults can occur with straight axes composed of equal or unequal barrel vaults; with an annular vault intersected by a conical vault, or by an underpitch vault. (Fig. 5). *Irregular* vaults are those in this category which do not conform to any regular geometrical shape. This section is subdivided into *tripartite* and *polygonal*, according to whether, in the first case, they cover a triangular space caused, for instance, from the intersection of three barrel or three expanding vaults; or, in the polygonal case, whether they

VAULT



1 Church of Saint Etienne-le-Vieux, France (Late Gothic)
2 Transition Romanesque-Gothic
3 Transition Romanesque-Gothic
4 Early Gothic

cover octagonal, decagonal, etc., rooms. *Fan-Tracery vaulting* is a *solid* variety common in the Later Gothic period. It contains no ribs in the construction (see *Ribbed Vaulting Gothic*), but the surfaces are covered ornamentally with mullions and tracery bars enclosing panels. Saint George's Chapel, Windsor, England, is a fine example. Fan-tracery vaults can be subdivided into *pyramidoidal* and *conoidal*. In the former case two halves of an inverted concave pyramidoid are set opposite each other, their bases forming the ridge of the arch. The *conoidal* class, as its name implies, is of circular section not having angles as do the pyramidoidal. Pyramidoids and conoids are called sometimes *pendentives*. (See Fig. 3). In *Rib vaulting* the surfaces are outlined into panels by a *rib* structure or raised frame-work. Originally the *ribbing* was first constructed separately, then the panel filled in and supported by the *ribs*. Frequently in later work the ribbing is a purely ornamental addition. The *rib*,



Romanesque, Showing Pendentives Supporting the Domes of the Vaulting.

therefore, takes the place of the *groin*. And this new method of vault construction inaugurates the Gothic period. In the 12th century Gothic the former style of apse vaulting (hemispherical) gave way to the *chevet* vault in which the masonry courses run perpendicularly, instead of horizontally, from radiating ribs having a common keystone. These run to a wall rib or line over the heads of the apse windows.

Historical.— Tunnel vaulting has been used at least since the Egyptian period to the Carolingian Empire days. The dome vault (cupola) is characteristic of the Byzantine architecture. In the Romanesque period (early 11th to middle 12th century) the naves and aisles of churches had three main forms of vaulting: the dome, the tunnel and the groined. And, as before stated, with the ribbed vault we enter the Gothic era. The dome had for its support pendentives, either the spherical or the "squinch" (see Fig. 6) or the "trumpet" arch. While there have been spherical pendentives found in Byzantine architecture it was in the 6th century that this system of vaulting was used first largely. But

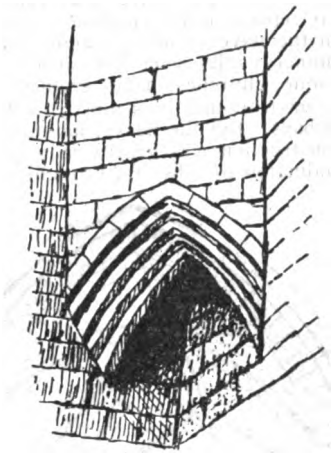
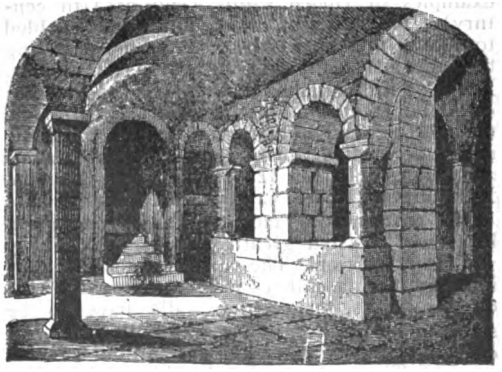


FIG. 6.— Squinch Arch.

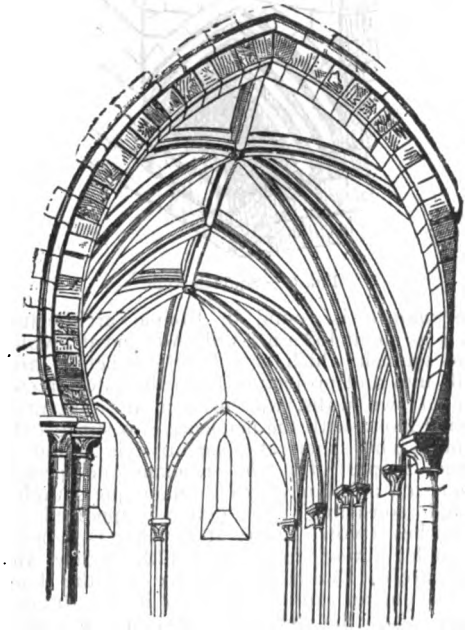
the *squinch* is found in Roman architecture early as about 138 A.D. (Villa Adriana at Tivoli). The squinch which is a lintel, corbel or arch built into and projecting from the interior corner of two walls, was used in the Byzantine period along with the pendentive to support the dome. The spherical pendentive is found as dome support for the Romanesque period. There are a few naves of Romanesque churches found consisting of domes supported on squinches (Notre Dame at Le Puy is a noted example) dating from 11th to 12th century. But such are of Byzantine influence and the dome passes out as vaulting medium in the Romanesque while the tunnel vault comes into play, not as before with the Romans as culverts, drains, etc., but for vaulting the ceilings of



Carlovingian Vaulting, Anterior to 9th Century.

naves and aisles of stately Romanesque churches. There are four major schools of Romanesque tunnel-vaulted churches in France: Provence, Poitou, Auvergne and Burgundy (11th and part of 12th century). But with Poitou we come to tunnel-vaulted naves and

groined vaults for aisles. In the Auvergne school we find the triforium has half-barrel vaulting. In the side aisles of the Burgundy school are, usually, groined vaults, some of slightly domical form. The nave arcade structural arches are pointed but the nave has a tunnel vault its entire length. Other Romanesque style churches have transverse tunnel vaults to replace those running longitudinally either in the nave or aisles; some have transverse tunnel vaults over the aisles. A few Romanesque churches have groined vaulting over the nave though it is mostly restricted to the aisle bays. But the heavy, massive Romanesque construction was greatly transformed by the introduction of ribs and brought about the



Ribbed Vaulting Gothic, 13th Century.

light Gothic style. Lombardy has the earliest examples of ribbed vaults (end of 11th century). The width of the nave now was enabled to take in the full width of the edifice, omitting the side aisles, the ribs aiding in the support. But the Anjou builders soon realized that domes could be erected almost without centring and the ribs gradually diminished till they became mere decorative torus moldings for groins and ridges. In the 12th century we have the Norman sexpartite vaulting and its variants (eight part vaulting, etc.), and the use of flying buttresses assisted greatly in permitting fancy vault construction. The various kinds of vaultings exert a lateral as well as vertical thrust on the walls, hence the walls have to be strengthened either by an extra thickness of construction or by external addition of buttresses. The necessary solidity is sometimes afforded by a division into niches and piers and the vaulting is then specially constructed to bring the vertical and lateral thrust on the piers, leaving the walls that connect the piers to fill the function of enclosing the room space only. The Ile-de-France architects at this time were elaborating the four-part cross-ribbed vault of rectangular plan. In the second half of the 12th century we find the beginning of the Early Gothic evolving from the Romanesque; this phase is known as the Transition period. The

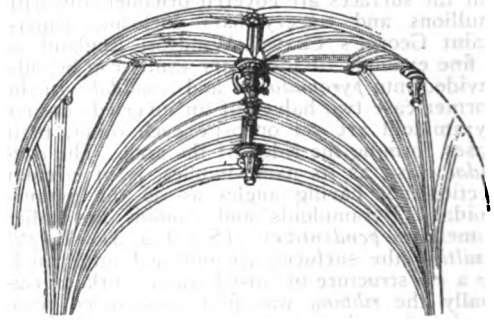
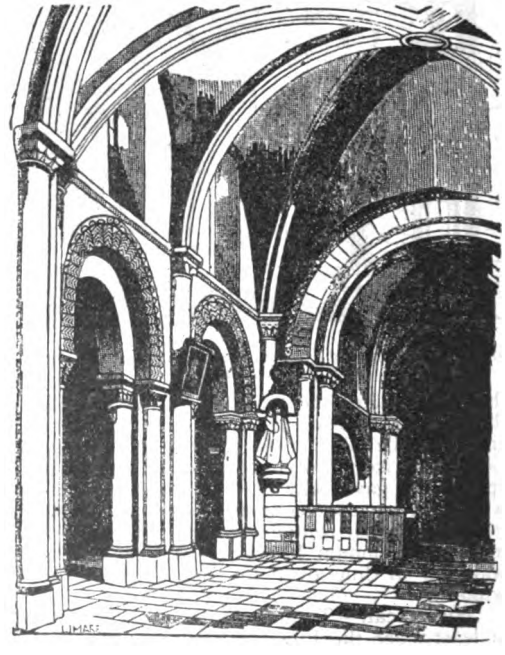


FIG. 7. — Renaissance Vault Decorated with Pendentives.

Gothic (see ARCHITECTURE) arch is «pointed» hence we find in the Transition vaulting the pointed arch with its moldings decorated with Romanesque motifs. *Renaissance vaulting.* This style retained all the Gothic essentials but made the arch elliptic or depressed. The arches are multiplied and often are adorned with cul-de-lampes and pendentives (Fig. 7) hanging often like stalactites from the vaulting. In later Renaissance architecture the churches are frequently built in the form of large single chambers and ceiled with barrel vaulting, in which cases deeply recessed chapels between strong piers were introduced into the side walls, and above these the vault was pierced and lighted by lunettes. *Decoration.* The Romans



Crossed Arched Vaultings.

gave the barrel vault a rich decorative appearance by means of a bold cornice. With lines and cross-bands they then divided the vault surface into bays (similar to the later coffers)

or compartments each having a flower boss as its central ornament. These coffers are frequently finely molded if the size admits it. In the Renaissance barrel-vaulted rooms the richly molded coffers are frequently of slight depth. In the later Renaissance period the roof was constructed of barrel vaulting and it received divisions of flat bands continuing from the pilasters of the walls, the divided spaces being given plastic decoration or sometimes receiving painting. The dome vault was beautifully decorated in several manners. That of the old Pantheon at Rome received majestic sedate ornament by encircling it with five horizontal rings or zones each containing 28 coffers, which were surrounded with rich listels of foliage and, as centres, rosettes of bronze. Looking upward in the direction of the opening in the centre the general impression is that the zones are of equal width but, in reality, they diminish all the way up as, of course, the square coffers being of same number in a smaller circle had to be smaller in proportion to the diminution of the circle. The perspective effect is perfect. In the case of the temple of Minerva Medica, Rome, the dome is closed on top and the lighting is done by means of the circle of windows piercing the structure above the semicircular niches below.

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CLEMENT W. COUMBE.

VAUQUELIN, vō'kē-lăń, **Louis Nicolas,** French chemist: b. near Caen Normandy, 16 May 1763; d. 14 Nov. 1829. He studied pharmacy and became known to Fourcroy, who presently made him his assistant in his philosophical researches and lectures. After being chief pharmaceutist in the military hospital at Melun in 1793, he was appointed inspector and professor of docimacy in the mining school at Paris and then assistant professor of chemistry in the polytechnic school and a member of the French Institute. He succeeded Darcet in the chair of chemistry at the College of France, and, resigning his inspectorship of mines, became director of the school of pharmacy just established by the government. On the death of Brongniart he received the professorship of chemistry in the Jardin des Plantes and succeeded Fourcroy in the same capacity in the faculty of medicine. He had remarkable talents for analysis; his discoveries, among which those of chromium and glucina deserve special notice, have been useful in various branches of art and science. His 'Manuel de l'essayeur' (1812) has been superseded, but his 'Mémoires,' amounting to more than 250 in number and printed in the *Annales de chimie*, the *Journal des mines*, the *Annales du muséum*, and the *Recueil de l'académie des sciences*, in spite of their age, are still valuable.

VAUTIER, vō-tē-ā, **Benjamin,** Swiss painter: b. Morges, on the Lake of Geneva, 24 April 1829; d. 1898. He began his art training at Geneva and for some years earned his living as an enameler of metal ornaments. In 1850 he joined the classes of R. Jordan at Düsseldorf and began his study of peasant life in the highlands of Bern. In 1856 he went to Paris and on his return to Düsseldorf produced the first of his Bernese pictures 'The Interior of a Swiss Village Church, with Worshippers.' From that time he gradually gained the reputation of one of the first Swiss genre painters by the series of pictures in which he portrayed scenes from peasant life not only in Switzerland but in Swabia and Bavaria. His works are all distinguished by faultless drawing; robust individuality; vividness in the delineation of local and national types, and they are, moreover, as is natural to the subjects treated of, brimful of delightful humor. As a colorist Vautier is master of harmony and his composition is graceful and dramatic. Among the finest and most popular of his works may be mentioned 'Card-playing Peasants Surprised by their Wives'; 'Sunday Afternoon in Swabia'; 'Toasting the Bride'; 'Country Funeral'; 'Black Peter', etc. He was also successful as an illustrator of books and his designs for Immerman's 'Oberhof'; Auerbach's 'Barfüssele' and for 'Hermann und Dorothea' are very fine and have been much admired. Consult Rosenberg, 'Benjamin Vautier' (1897).

VAUVENARGUES, vōv-närg, **Luc de Clapier,** MARQUIS DE, French moral philosopher: b. Aix, Provence, 6 Aug. 1715; d. Paris, 28 May 1747. He entered the army in 1733, but resigned with broken health at 27. As a philosopher he inclines to the Stoic school and his work was warmly praised by Voltaire, of whom he was a friend; but popular appreciation of his writings came only after his death. He wrote 'Introduction to a Knowledge of the Human Mind' (1746), followed by 'Reflections' and 'Maxims.' Consult Paléologue, 'Vauvenargues' (1890).

VAUX, vâks, **Calvert,** American landscape architect: b. London, 20 Dec. 1824; d. Bensonhurst, L. I., 19 Nov. 1895. He was educated in London and in 1848 came to the United States as the assistant of A. J. Downing, the celebrated American landscape designer, whose partner he became in 1851. He assisted in laying out the grounds surrounding the Capitol and Smithsonian Institution at Washington and in partnership with F. L. Olmsted (q.v.), he laid out Central Park in New York. In 1865 his design for Prospect Park, Brooklyn, was accepted and he was subsequently engaged with Mr. Olmsted in laying out parks in Chicago, Buffalo, the State reservation at Niagara Falls and at other cities and towns throughout the United States. They laid out Riverside and Morningside parks in New York, Vaux becoming landscape architect of the public parks in 1881. He designed the Museum of Natural History (1873) and the Metropolitan Museum of Art (1874) in New York, besides other public buildings. To him is due credit for the artistic and original treatment of the transverse roads

in Central Park. He wrote 'Villas and Cottages' (1857).

VAUX, Richard, American lawyer: b. Philadelphia, Pa., 19 Dec. 1816; d. there, 22 March 1895. He was admitted to the bar in 1836, soon after was sent as bearer of despatches to the United States Minister in London and on his arrival there was appointed secretary of the legation. In the following year he went to Brussels to assist in reorganizing the United States embassy there and later returned to London where he was appointed private secretary to the United States Minister, Andrew Stevenson. He returned to the United States in 1839, was recorder of deeds at Philadelphia in 1842–49. In 1843 he was appointed inspector of the State prison and was also elected comptroller of the public schools, thus occupying three important public offices at the same time. He was elected mayor of Philadelphia in 1855, became president of the board of directors of Girard College in 1859, was largely instrumental in securing, in 1885, the present charter of Philadelphia, and in 1890 was elected to Congress. He published 'Recorder's Decisions' (1845) and 'Reports of the Penitentiary' (45 vols., 1842 et seq.).

VAUX, Thomas, Lord, English poet: b. Harrowden, England, 1510; d. October 1556. He was educated at Cambridge, succeeded to the barony at 13 and accompanied Cardinal Wolsey on his embassy to France in 1527. In 1530 he took his seat in the House of Lords, attended Henry VIII to Calais and Boulogne in 1532 and in 1533 was created Knight of the Bath and appointed captain of the Island of Jersey, an office he resigned in 1536. He occupied his seat in the House of Lords until 1555. Such of his verse as survives consists in the main of lyrics, which were much admired in their day. In 'The Paradyse of Daynty Devises' appear several of his poems, the best of which, 'The Aged Lover renounceth Love' and 'The Assault of Cupid' were previously published in Tottin's 'Miscellany' (1557).

VAUXHALL (vâks'hâl) **GARDENS,** in London, formerly a fashionable place of entertainment and summer resort situated near the Thames, in the parish of Lambeth, about one and one-half miles from Westminster Bridge. They were removed about 1860 and built over.

VAVASOUR, or **VALVASSOR,** in feudal times, a person of rank next below a baron; one who held his lands not from the Crown but of one of the higher nobility. See Feudalism.

VAWTER, Charles Erastus, American educator: b. Monroe County, W. Va., 9 June 1841; d. 27 Oct. 1905. He served in the Confederate army in 1861–65, obtaining a captaincy in the "Stonewall" brigade; was graduated from Emory and Henry College (Emory, Va.) in 1866; studied also at the University of Virginia (Charlottesville); and was professor of mathematics at Emory and Henry from 1868 to 1878. In 1878 he became superintendent of the Miller Manual Labor School at Albemarle, Va. He was considered an authority on manual training.

VAYU, in the Hindu mythology, is the name of the genius of the air. Though thought of as a single personality he is a deified personification of the wind in the Vedic mythology, while in the Puranic mythology he fills only a subordinate place. The legend assigns to him the paternity of the monkey god Hanuman and he also is regent of the northwest. In the Reg-Veda he is described as a real person who may be invited to partake of oblations.

VEADER, vē'ą-dėr, or **VEADER,** an additional or supplementary month of the Jews, added sometimes after the third, sometimes after the second sacred year, care being taken that the seventh year should have no such month appended to Adar.

VEBLEN, Thorstein B., American publicist. He was graduated at Carleton College, Minn., in 1880, studied later at Johns Hopkins, Yale, Cornell and Chicago, was instructor in political economy at the University of Chicago 1896–1900, and professor of the same there until 1906; Stanford University until 1910, and the University of Missouri since then. He has been editor of *The Journal of Political Economy* and has published 'The Theory of the Leisure Class' (1899); 'The Theory of Business Enterprise' (1904); 'The Instinct of Workmanship' (1914); 'Imperial Germany and the Industrial Revolution' (1915); also a number of papers in various journals.

VECCHI, vēk'ē, **Augustus Victor,** Italian naval writer: b. Marseilles, France, 1843. He was educated in the Royal Naval School at Genoa, rose to be lieutenant in the naval service (1866), and resigned in 1872. He published on naval subjects several works of history and fiction using the pen-name "Jack da Bolina." The volumes include 'Saggi Storico-Marinareschi' (1877); 'Leggende di Mare' (1879); 'Nuove Leggende' (1880); 'La Vita e le Geste del Generale G. Garibaldi' (1882); 'Ironie Blande' (1889); 'Bozzetti di Mare' (1897); 'Memorie di un Luogotenente di Vascello' (1897); 'L'Italia Marinare o il Lido della Patria' (1899). Vecchi was among the promoters of the Italian navy league (La Lega Navale).

VECTOR, in mathematics. See Mathematics; Vector Analysis.

VECTOR ANALYSIS. 1. A quantity which is related to a definite direction in space is called a *vector quantity*, e.g., the displacement of a point, velocity, force, axis of rotation, electric current; a quantity having no reference to direction is called a *scalar quantity*, e.g., mass, volume, time, energy, electric charge. A vector quantity can be represented by a line segment if (1) the length of the segment is taken to represent on an assigned scale the magnitude of the quantity; (2) the segment be placed in the proper direction; and (3) be given an arrowhead showing in which of the two opposite senses it is regarded as pointing. Such a directed line segment is called a *vector*. In accordance with etymology the vector **AB** may be regarded as the operator which carries a moving point from *A* to *B*, and is represented by an arrow reaching from its initial to its terminal point. (Bold face type is used for vectors).

2. **Equal Vectors.**—The vectors **AB** and **CD** are said to be equal when the segments *AB* and *CD* are equal and parallel, and the arrow heads from *A* to *B* and from *C* to *D* point in the same sense. If *AB* and *CD* are equal and parallel, but the arrow heads are in opposite senses we say that **AB=—CD=DC.**

3. **Addition of Vectors.**—Two vectors AB and CD are added by drawing through the terminal point of the first another vector BE equal to the second; the vector AE is then called the sum of AB and BE, and also of AB and CD. The annexed parallelogram shows that vector addition is commutative, that is $\mathbf{a}+\mathbf{b}=\mathbf{b}+\mathbf{a}$. Similarly for the addition

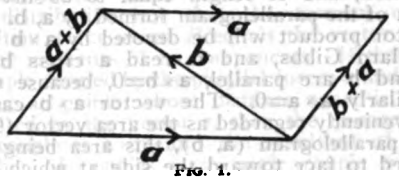

FIG. 1.

of three or more vectors. In any closed polygon ABCDE we have $\mathbf{AB}+\mathbf{BC}+\mathbf{CD}+\mathbf{DE}=\mathbf{AE}$ and $\mathbf{AB}+\mathbf{BC}+\mathbf{CD}+\mathbf{DE}+\mathbf{EA}=\mathbf{AA}=0$ whether the vertices are in one plane or not.

The difference of two vectors is the sum of the first and the opposite of the second, that is $\mathbf{a}-\mathbf{b}=\mathbf{a}+(-\mathbf{b})$.

4. **Resolution of Vectors.**—Vectors are called *coplanar* when they are parallel to the same plane. Any vector r, coplanar with two non-parallel vectors a and b, can be resolved into two components parallel to a and b, by constructing a parallelogram whose diagonal is r and whose sides are parallel to a and b; hence r can be expressed in the form $\mathbf{r}=x\mathbf{a}+y\mathbf{b}$, where x and y are scalar numbers expressing the ratios of the two component vectors to the parallel vectors a and b. Similarly by constructing a parallelopiped, r may be resolved into three components parallel to three given non-coplanar vectors a, b, c, in the form $\mathbf{r}=x\mathbf{a}+y\mathbf{b}+z\mathbf{c}$.

It is usual to take instead of a, b, c, three vectors i, j, k of unit length along three rectangular axes OX, OY, OZ, then $\mathbf{r}=x\mathbf{i}+y\mathbf{j}+z\mathbf{k}$, where x, y, z are the co-ordinates of the terminal point of r, its initial point being at O. The axes are usually taken to form a *right-handed* system, positive rotation about OX, OY and OZ respectively carrying OY to OZ, OZ to OX, and OX to OY.

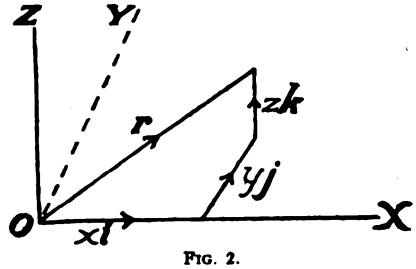

FIG. 2.

5. **Conditions for Equality.**—A vector equation $\mathbf{r}=\mathbf{r}'$, that is, $x\mathbf{a}+y\mathbf{b}+z\mathbf{c}=x'\mathbf{a}+y'\mathbf{b}+z'\mathbf{c}$, where a, b, c are non-coplanar, necessitates the three scalar equations $x=x'$, $y=y'$, $z=z'$. In two dimensions, the equation $x\mathbf{a}+y\mathbf{b}=x'\mathbf{a}+y'\mathbf{b}$, where a and b are not parallel, necessitates the two scalar equations $x=x'$, $y=y'$.

6. **Vector of a Point.**—The position of a point A may be defined by means of its vector $\mathbf{OA}=\mathbf{a}$, drawn from a fixed origin, and A may be called the point whose vector is a, or the point a. The indefinite line AB is denoted by (a, b). The vector AB equals b—a, that is, terminal vector minus initial vector; similarly BA equals a—b.

7. **Vector Equation of a Line.**—Let $\mathbf{OP}=\mathbf{r}$ be the vector of a running point on the line (a, b); then since $\mathbf{OP}=\mathbf{OA}+\mathbf{AP}$ and $\mathbf{AP}=x\,\mathbf{AB}$, where x is the scalar expressing the ratio of AP to AB, hence $\mathbf{r}=\mathbf{a}+x(\mathbf{b}-\mathbf{a})$. This equation gives the vector of P in terms of a varying scalar x.

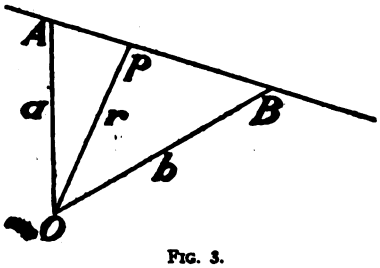

FIG. 3.

Example 1.—If the segment (a, b) is divided as m_1 to m_2, the vector of P is $(m_1\mathbf{b}+m_2\mathbf{a})/m_1+m_2$.

Example 2.—If masses m_1, m_2 are placed at $\mathbf{a}_1$, $\mathbf{a}_2$, their centre of gravity is $(m_1\mathbf{a}_1+m_2\mathbf{a}_2)/m_1+m_2$. Extend this to three masses m_1 m_2, m_3 at $\mathbf{a}_1$, $\mathbf{a}_2$, $\mathbf{a}_3$.

Example 3.—The medians of a triangle trisect each other. Take the origin at one vertex O, and let the other vertices be a, b, then $\frac{1}{2}\mathbf{a}$ and $\frac{1}{2}\mathbf{b}$ are mid-points, hence the equations of two medians are $\mathbf{r}=\mathbf{a}+x(\frac{1}{2}\mathbf{b}-\mathbf{a})$, $\mathbf{r}=\mathbf{b}+y(\frac{1}{2}\mathbf{a}-\mathbf{b})$. Making these equations simultaneous and equating coefficients of a and b, respectively (5), we get $1-x=\frac{1}{2}y$, $\frac{1}{2}x=1-y$, whence $x=\frac{2}{3}$, $y=\frac{2}{3}$.

8. **Rotors.**—A rotor is a vector magnitude restricted to lie in some fixed straight line, called its line of position, or its axis. A rotor is completely specified by its magnitude, direction, sense, and one point on its axis; a familiar example is a force; it can be transferred to any point in its line of action, but cannot be moved out of that line. Another example is a given angular velocity of rotation about a given axis; it can be specified by laying along the axis a segment whose length represents, on a convenient scale, the magnitude of the angular velocity, and which points in the direction from which the rotation appears positive. This special kind of directed segment has given rise to the name rotor for any directed magnitude having an axis. The resultant of any number of rotors (of the same class) whose axes meet in a point P is found by treating them as ordinary vectors, taking their vector sum and transferring it to the point P. A force R applied at P can be resolved into three components parallel to the three axes and acting at P, so that $\mathbf{R}=i\mathbf{X}+j\mathbf{Y}+k\mathbf{Z}$.

9. **Vector of an Area.**—A plane area may be regarded as having magnitude and direction (orientation or facing), and can be represented by a vector normal to its plane, of length equal to the area on an assigned scale, and with an arrow pointing toward the side to which the

area is supposed to face. If a given plane area is projected on any other plane, and if the projection is represented by a normal vector, this vector will be the projection of the vector of the given plane area.

10. Vector Sum for Faces of Polyhedron. — The sum of the vectors representing the faces of a closed polyhedron is zero, all of these being supposed to face outwards. For, if we project the entire surface on any plane, the part farthest from the plane projects into an area whose total vector may be represented by V, and the remainder of the surface projects into an area whose total vector is $-V$, pointing in the opposite direction. Thus the projection of the original vector sum on the normal to the plane is zero; and since this is true for every plane, the original vector sum must itself be zero.

11. Scalar Product. — The *scalar product* of two vectors is the result obtained by multiplying the product of their lengths by the cosine of the angle between them. It may also be defined as the product of the length of either vector by the projection of the other upon it. The scalar product is denoted by writing the two vectors with a dot between them as $\mathbf{a}\cdot\mathbf{b}$. This product evidently is commutative, so that $\mathbf{a}\cdot\mathbf{b}=\mathbf{b}\cdot\mathbf{a}=ab\cos\theta$, where a, b are the lengths (or tensors) of the vectors, and θ the angle between their directions. If m and n are scalars, $m\mathbf{a}\cdot n\mathbf{b}=mn\,(\mathbf{a}\cdot\mathbf{b})$. If $\mathbf{a}$ and $\mathbf{b}$ are parallel, $\mathbf{a}\cdot\mathbf{b}=ab$; and $\mathbf{a}\cdot\mathbf{a}=a^2$. If $\mathbf{a}$ and $\mathbf{b}$ are at right angles, $\mathbf{a}\cdot\mathbf{b}=0$. The scalar multiplication table for the three fundamental unit vectors $\mathbf{i}$, $\mathbf{j}$, $\mathbf{k}$ is

$$\mathbf{i}\cdot\mathbf{i}=\mathbf{j}\cdot\mathbf{j}=\mathbf{k}\cdot\mathbf{k}=1.$$
$$\mathbf{i}\cdot\mathbf{j}=\mathbf{j}\cdot\mathbf{i}=\mathbf{j}\cdot\mathbf{k}=\mathbf{k}\cdot\mathbf{j}=\mathbf{k}\cdot\mathbf{i}=\mathbf{i}\cdot\mathbf{k}=0$$

Scalar multiplication is distributive, i.e., $(\mathbf{a}+\mathbf{b})\cdot\mathbf{c}=\mathbf{a}\cdot\mathbf{c}+\mathbf{b}\cdot\mathbf{c}$; this follows from the fact that the projection of $\mathbf{a}+\mathbf{b}$ on the direction of $\mathbf{c}$ equals the sum of the projections of $\mathbf{a}$ and of $\mathbf{b}$ on the same direction.

12. Expansion of $\mathbf{a}\cdot\mathbf{b}$. — If $\mathbf{a}=a_1\mathbf{i}+a_2\mathbf{j}+a_3\mathbf{k}$, and $\mathbf{b}=b_1\mathbf{i}+b_2\mathbf{j}+b_3\mathbf{k}$, then, applying the distributive law and the multiplication table, we get

$$a\cdot b=a_1b_1+a_2b_2+a_3b_3.$$

A trigonometrical interpretation is obtained by replacing $\mathbf{a}\cdot\mathbf{b}$ by $ab\cos\theta$, dividing by ab, and noticing that

$$\frac{a_1}{a}=\cos\alpha_1,\ \frac{a_2}{a}=\cos\beta_1,\ \frac{a_3}{a}=\cos\gamma_1,\ \frac{b_1}{b}=\cos\alpha_2,$$

$$\frac{b_2}{b}=\cos\beta_2,\ \frac{b_3}{b}=\cos\gamma_2$$ where $(\alpha_1, \beta_1, \gamma_1)$ are the direction angles of $\mathbf{a}$, and $(\alpha_2, \beta_2, \gamma_2)$ are those of $\mathbf{b}$. This gives the cosine formula,
$\cos\theta=\cos\alpha_1\cos\alpha_2+\cos\beta_1\cos\beta_2+\cos\gamma_1\cos\gamma_2$.
As an application to two dimensions, we may

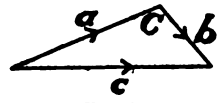

FIG. 4.

take $\mathbf{c}=\mathbf{a}+\mathbf{b}$ as in the figure, then
$\mathbf{c}\cdot\mathbf{c}=(\mathbf{a}+\mathbf{b})\cdot(\mathbf{a}+\mathbf{b})=\mathbf{a}\cdot\mathbf{a}+\mathbf{a}\cdot\mathbf{b}+\mathbf{b}\cdot\mathbf{a}+\mathbf{b}\cdot\mathbf{b}=a^2+2ab\cos(\pi-c)+b^2=a^2+b^2-2ab\cos C$, a fundamental relation in a triangle. For an application to mechanics let $\mathbf{a}$, $\mathbf{b}$, $\mathbf{c}$ represent forces applied at O, and let $\mathbf{r}$ be their resultant, then $\mathbf{r}=\mathbf{a}+\mathbf{b}+\mathbf{c}$. Let O be displaced to P, and let $\mathbf{OP}=\mathbf{d}$, then $\mathbf{r}\cdot\mathbf{d}=\mathbf{a}\cdot\mathbf{d}+\mathbf{b}\cdot\mathbf{d}+\mathbf{c}\cdot\mathbf{d}$; but $\mathbf{a}\cdot\mathbf{d}$ is the work done by the force $\mathbf{a}$ in the displacement $\mathbf{d}$; hence the work done by a force in any displacement equals the sum of the amounts of work done by its components.

13. Vector Product. — The vector product of $\mathbf{a}$ and $\mathbf{b}$ is a third vector normal to the plane of $\mathbf{a}$ and $\mathbf{b}$ pointing toward the direction from which rotation from $\mathbf{a}$ to $\mathbf{b}$ is seen as positive rotation, and of length equal to $ab\sin\theta$, the area of the parallelogram formed by $\mathbf{a}$, $\mathbf{b}$. The vector product will be denoted by $\mathbf{a}\times\mathbf{b}$ after Willard Gibbs, and is read $\mathbf{a}$ cross $\mathbf{b}$. If $\mathbf{a}$ and $\mathbf{b}$ are parallel, $\mathbf{a}\times\mathbf{b}=0$, because $\theta=0$; similarly $\mathbf{a}\times\mathbf{a}=0$. The vector $\mathbf{a}\times\mathbf{b}$ can be conveniently regarded as the area vector (9) of the parallelogram $(\mathbf{a}, \mathbf{b})$, this area being supposed to face toward the side at which rotation from $\mathbf{a}$ to $\mathbf{b}$ appears positive. The commutative law does not hold in vector multiplication for $\mathbf{a}\times\mathbf{b}=-\mathbf{b}\times\mathbf{a}$.

14. Distributive Law. — Vector multiplication is distributive, that is

$$\mathbf{c}\times(\mathbf{a}+\mathbf{b})=\mathbf{c}\times\mathbf{a}+\mathbf{c}\times\mathbf{b}.$$

First suppose that $\mathbf{c}$ is not coplanar with $\mathbf{a}$ and $\mathbf{b}$; and construct a triangular prism having the vectors $\mathbf{a}$, $\mathbf{b}$, and $\mathbf{a}+\mathbf{b}$ for sides of base, and $\mathbf{c}$ for the parallel edges. The sum of the area vectors of the faces of the prism is zero (10),

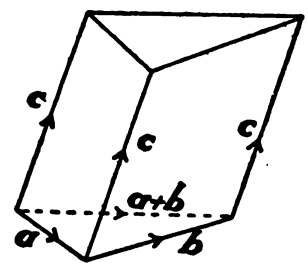

FIG. 5

and the vectors of the two opposite bases cancel; but the vectors of the lateral faces pointing outward are $\mathbf{c}\times(\mathbf{a}+\mathbf{b})$, $-\mathbf{c}\times\mathbf{a}$, $-\mathbf{c}\times\mathbf{b}$, hence

$$\mathbf{c}\times(\mathbf{a}+\mathbf{b})=\mathbf{c}\times\mathbf{a}+\mathbf{c}\times\mathbf{b}.$$

If $\mathbf{c}$ happens to be coplanar with $\mathbf{a}$ and $\mathbf{b}$ we can resolve it into two which are not coplanar with $\mathbf{a}$ and $\mathbf{b}$, apply the preceding result, and then combine. For the fundamental unit vectors $\mathbf{i}$, $\mathbf{j}$, $\mathbf{k}$, the vector multiplication table is

$\mathbf{i}\times\mathbf{i}=\mathbf{j}\times\mathbf{j}=\mathbf{k}\times\mathbf{k}=0$; $\mathbf{i}\times\mathbf{j}=-\mathbf{j}\times\mathbf{i}=\mathbf{k}$; $\mathbf{j}\times\mathbf{k}=-\mathbf{k}\times\mathbf{j}=\mathbf{i}$; $\mathbf{k}\times\mathbf{i}=-\mathbf{i}\times\mathbf{k}=\mathbf{j}$.

15. Expansion of $\mathbf{a}\times\mathbf{b}$. — If $\mathbf{a}=a_1\mathbf{i}+a_2\mathbf{j}+a_3\mathbf{k}$, $\mathbf{b}=b_1\mathbf{i}+b_2\mathbf{j}+b_3\mathbf{k}$, then by applying the distributive law, and the table we get $\mathbf{a}\times\mathbf{b}=(a_2b_3-a_3b_2)\,\mathbf{i}+(a_3b_1-a_1b_3)\,\mathbf{j}+(a_1b_2-a_2b_1)\mathbf{k}$. There are various interpretations of this result. From it we can easily obtain the three projections of the area of the parallelogram formed by $(\mathbf{a}, \mathbf{b})$; also the directions of its normal; also $\sin\theta$ in terms of the direction cosines of $\mathbf{a}$ and $\mathbf{b}$; also the area of any triangle in terms of the co-ordinates of its vertices.

For an application to plane analytic geometry, suppose $\mathbf{a}$ and $\mathbf{b}$ both lie in the xy-plane, then $a_3=0$, $b_3=0$, and $\mathbf{a}\times\mathbf{b}=(a_1b_2-a_2b_1)\mathbf{k}$, hence $ab\sin\theta=a_1b_2-a_2b_1$; this gives twice the area of a triangle one of whose vertices is at $(0, 0)$, and whose other vertices are at (a_1, a_2),

(b_1, b_2). Again, if we divide by ab, we can show that $\sin(a_2 - a_1) = \sin a_2 \cos a_1 - \cos a_2 \sin a_1$; and can then find $\sin(a_2 + a_1)$ by changing the sign of x_1. Similarly we could find $\cos(a_2 - a_1)$ by taking the scalar instead of the vector product.

In mechanics the moment of a force **a** acting at O, taken about a point P whose vector $\mathbf{OP}=\mathbf{r}$, is the vector $\mathbf{a}\times\mathbf{r}$; it follows from the distributive law that the moment of a resultant force about P equals the vector sum of the moments of its components. If there is a couple formed by the parallel forces **a** and $-\mathbf{a}$ acting at points whose distance apart is represented by the vector **r**, then the moment of the couple is $\mathbf{a}\times\mathbf{r}$; and the resultant of any number of couples is a single couple whose vector is the sum of the vectors of the given couples.

16. Triple Scalar Product.— It is evident that $\mathbf{a}\cdot(\mathbf{b}\times\mathbf{c})$ is the volume of the parallelopiped whose adjacent edges are **a**, **b**, **c**, hence $\mathbf{a}\cdot(\mathbf{b}\times\mathbf{c})=\mathbf{b}\cdot(\mathbf{c}\times\mathbf{a})=\mathbf{c}\cdot(\mathbf{a}\times\mathbf{b})$, where the letters are in the same cyclic order; if the cyclic order is changed the sign of the triple product is altered. The dot and cross can be interchanged, for $\mathbf{a}\cdot(\mathbf{b}\times\mathbf{c})=(\mathbf{a}\times\mathbf{b})\cdot\mathbf{c}$.

17. Triple Vector Product.— It can be shown by expansion that the triple vector product can be resolved into scalar multiples of two of the given vectors, in the form

$$\mathbf{a}\times(\mathbf{b}\times\mathbf{c})=(\mathbf{a}\cdot\mathbf{c})\,\mathbf{b}-(\mathbf{a}\cdot\mathbf{b})\mathbf{c}.$$

18. Vector and Scalar Fields.— The theories of fluid motion, heat, electricity, etc., are largely concerned with vector and scalar fields. With every point (x, y, z) are associated such scalars as mass, density, potential, and such vectors as velocity, force, displacement, flux, all of which are functions of (x, y, z).

19. Directional Derivative of a Scalar Function.— If a moving point P is displaced from (x, y, z) to a neighboring position in the direction ds, the rate of change of a scalar function $V(x, y, z)$ per unit of displacement is given by the directional derivative

$$\frac{dV}{ds}=\frac{\partial V}{\partial x}\frac{dx}{ds}+\frac{\partial V}{\partial y}\frac{dy}{ds}+\frac{\partial V}{\partial z}\frac{dz}{ds}=\frac{\partial V}{\partial x}\cos\alpha+\frac{\partial V}{\partial y}\cos\beta+\frac{\partial V}{\partial z}\cos\gamma=\left(\mathbf{i}\frac{\partial V}{\partial x}+\mathbf{j}\frac{\partial V}{\partial y}+\mathbf{k}\frac{\partial V}{\partial z}\right)\cdot(\mathbf{i}\cos\alpha+\mathbf{j}\cos\beta+\mathbf{k}\cos\gamma),$$

in which the second factor is a unit vector in the direction of ds, whose direction angles are α, β, γ.

20. Tangential and Normal Derivatives to a Level Surface.— Let the family of level surfaces for the function V have the equation $V(x, y, z)=C$, where C is an arbitrary constant; first let the displacement ds be tangential to the level surface that passes through P, then $dV/ds=0$, and the above scalar product is zero, hence the vector $\mathbf{i}\frac{\partial V}{\partial x}+\mathbf{j}\frac{\partial V}{\partial y}+\mathbf{k}\frac{\partial V}{\partial z}$ is perpendicular to ds, that is, to any tangent to the surface, and is, therefore, normal to the surface. Let N be the length of this normal vector, then $N^2=\left(\frac{\partial V}{\partial x}\right)^2+\left(\frac{\partial V}{\partial y}\right)^2+\left(\frac{\partial V}{\partial z}\right)^2$, and the direction cosines of this vector are $\frac{1}{N}\frac{\partial V}{\partial x}, \frac{1}{N}\frac{\partial V}{\partial y}, \frac{1}{N}\frac{\partial V}{\partial z}$. To find the rate of change of V in this normal direction we have $\frac{dV}{dn}=\left(\mathbf{i}\frac{\partial V}{\partial x}+\mathbf{j}\frac{\partial V}{\partial y}+\mathbf{k}\frac{\partial V}{\partial z}\right)\cdot(\mathbf{i}\cos\alpha+\mathbf{j}\cos\beta+\mathbf{k}\cos\gamma)=\left(\mathbf{i}\frac{\partial V}{\partial x}+\mathbf{j}\frac{\partial V}{\partial y}+\mathbf{k}\frac{\partial V}{\partial z}\right)\left(\mathbf{i}\frac{\partial V}{\partial x}+\mathbf{j}\frac{\partial V}{\partial y}+\mathbf{k}\frac{\partial V}{\partial z}\right)\frac{1}{N}=\frac{N^2}{N}=N=$ length of vector $\mathbf{i}\frac{\partial V}{\partial x}+\mathbf{j}\frac{\partial V}{\partial y}+\mathbf{k}\frac{\partial V}{\partial z}$; hence this vector is not only normal to the surface $V=C$, but represents in magnitude the rate of change of V in that direction; this vector is called the gradient of V, and is denoted by ∇V.

21. General Directional Derivative in Terms of Gradient.— Since $dV/ds=\nabla V\cdot(\mathbf{i}\cos\alpha+\mathbf{j}\cos\beta+\mathbf{k}\cos\gamma)$, where the latter factor is a unit vector in direction ds, hence $dV/ds=N(1)\cos\theta$, where θ is the angle between ∇V and ds; thus the derivative of V in any direction equals the projection of ∇V in that direction, hence ∇V points in the direction of most rapid increase of V.

22. Lines of the Gradient Vector.— If a point moves continuously from one level surface to another along successive gradients, the elements of these gradients form in the limit a continuous curve which is an orthogonal trajectory to the family of surfaces $V(x, y, z)=C$, and is called a *line of the vector* ∇V; and a series of such lines, passing through the perimeter of a small closed curve traced on a level surface, is called a *tube of the vector*.

23. Vector Functions.— A vector whose three components parallel to the co-ordinate axis are given functions of (x, y, z) is called a *vector function;* e.g., the resultant force at the point (x, y, z) of an electric field is of the form $\mathbf{R}=\mathbf{i}X+\mathbf{j}Y+\mathbf{k}Z$, where X, Y, Z are certain functions of (x, y, z). The simplest electric field is that due to a point charge m which repels the unit test charge placed at a distance r with a force m/r^2; the potential is $V=m/r$; the level surfaces are spherical; and the force $F=-\nabla V=-dV/dr=m/r^2$ along r.

24. Symbolic Scalar Product $\nabla\cdot\mathbf{a}$.— The vector operator $\nabla=i\frac{\partial}{\partial x}+j\frac{\partial}{\partial y}+k\frac{\partial}{\partial z}$ is called the Hamiltonian operator, from its inventor; but when used in combination it has the shorter name of *del*, due to Willard Gibbs; some use the name *nabla* suggested by Maxwell from resemblance to the Assyrian harp; Kelvin's name *atled*, the reverse of delta, is seldom used. The symbolic scalar product $\nabla\cdot\mathbf{a}=\left(\mathbf{i}\frac{\partial}{\partial x}+\mathbf{j}\frac{\partial}{\partial y}+\mathbf{k}\frac{\partial}{\partial z}\right)\cdot\left(\mathbf{i}a_1+\mathbf{j}a_2+\mathbf{k}a_3\right)=\frac{\partial a_1}{\partial x}+\frac{\partial a_2}{\partial y}+\frac{\partial a_3}{\partial z}$, (12), where the symbolic product of $\frac{\partial}{\partial x}$ and a_1 is taken as $\frac{\partial a_1}{\partial x}$, etc.

25. Flux of a Vector through an Area — Divergence.— The *flux* of *a* vector **a** through an element of area dS is defined as the product of dS by the normal component of **a** and is accordingly represented by $\mathbf{a}\cdot d\mathbf{S}$ where $d\mathbf{S}$ is the vector of the elementary area (9). It is easy to see that the algebraic sum of the

elements of outward flux through the faces of an elementary parallelopiped at (x, y, z) is $\left(\frac{\partial a_1}{\partial x}+\frac{\partial a_2}{\partial y}+\frac{\partial a_3}{\partial z}\right) dxdyds$, which is $\nabla.\mathbf{a}$ per unit volume. In case $\mathbf{a}$ is the velocity at (x, y, z) of a fluid $\nabla.\mathbf{a}$ is the rate at which matter is flowing out from (x, y, z) in unit time per unit volume, and is called the rarefaction or *divergence* at that point; and, by analogy, $\nabla.\mathbf{a}$ is called the outward flux or divergence for any vector $\mathbf{a}$. If $\mathbf{a}$ has a scalar potential, of which it is then the gradient, div $\mathbf{a}=\nabla.\nabla V=\nabla^2 V=\frac{\partial^2 V}{\partial x^2}+\frac{\partial^2 V}{\partial y^2}+\frac{\partial^2 V}{\partial z^2}$ called the Laplacian of V.

26. Gauss' Flux Integral.— Let S be a closed surface in the field of $\mathbf{a}$, divide it into small elements, and regard each element as plane, and represent it by normal vector $d\mathbf{S}$ drawn outwards (9), then the flux of $\mathbf{a}$ through S, is $\int\int \mathbf{a}\cdot d\mathbf{S}$; and Gauss' theorem expresses this in terms of a volume integral over the space within S by the equation

$$\int\int \mathbf{a}\cdot d\mathbf{S}=\int\int\int (\nabla\cdot\mathbf{a})dxdyds,$$

which is proved by summing up the flux out of the elementary parallelopipeds in (25). If $\mathbf{a}$ is the force due to a point charge, $\nabla\,\mathbf{a}=-\nabla^2 V$, where $V=m/r$, $\partial V/\partial x=-m/r^2(\partial r/\partial x)=-mx/r^3$, $\partial^2 V/\partial x^2=-m\,(r^2-3x^2)/r^5$,

$$\nabla^2 V=-m(3r^2-3x^2-3y^2-3z^2)/r^5=0,$$

except where $r=0$, thus $\nabla.\mathbf{a}=0$ except at $r=0$, hence by Gauss' equation, the flux through any surface not enclosing the point charge is zero, and the fluxes through all surfaces enclosing it are equal. To find this flux take a sphere of radius r with the point charge as centre, then the flux $=4\pi r^2(m/r^2)=4\pi m$. If there be any number of point charges the flux of force through any surface, enclosing charges whose algebraic sum is M, is $4\pi M$; and for a continuous distribution of density ρ, the outward flux is $4\pi\int\int\int \rho\ dxdyds$. Equating this to $\int\int\int \nabla(.\mathbf{a})dxdyds$, for any enclosed volume, we have $4\pi\rho=\nabla.\mathbf{a}=-\nabla^2 V$. This is Poisson's equation. At a point where $\rho=0$ we have $\nabla^2 V=0$, which is Laplace's equation.

27. Tubular or Solenoidal Vector Field.— Applying the flux theorem to the volume bounded by a vector tube and two normal sections we see that if $\nabla.\mathbf{a}=0$ the net outward flux is zero, hence the inward flux through one section equals the outward flux through the other, since there is no flux normal to the vector lines; thus, when the tube is very thin the magnitude of $\mathbf{a}$ varies inversely as the normal section of the tube; hence the variation of $\mathbf{a}$ in magnitude and direction as we pass along a line of the vector is exhibited by the variation of the thickness and direction of the vector filament; and, for this reason, a vector field which has no divergence is called a tubular or *solenoidal* field.

28. Green's Theorem.— If in Gauss's equation we replace $\mathbf{a}$ by $U\nabla V$ where U and V are scalar functions we get

$$\int\int U\nabla V.\,d\mathbf{S}=\int\int\int \nabla.(U\nabla V)dxdyds=$$
$$\int\int\int (\nabla U.\nabla V+U\nabla^2 V)dxdyds$$

This is called Green's theorem and has many applications; e.g. (1) if a continuous scalar function vanishes on the boundary of S, and satisfies Laplace's equation $\nabla^2 V=0$ within S, then it vanishes at all points within S. To prove this, let $U=V$ then by the conditions $\int\int\int (\nabla V)^2 dxdyds=0$, hence $\nabla V=0$ at all points within, therefore V is a constant, which is zero by the boundary condition. (2) There is only one solution to the problem of finding a continuous function V which shall take assigned values on S, and shall satisfy Poisson's equation $\nabla^2 V=-4\pi\rho$ within S where ρ is a given continuous function of (x, y, z). For, suppose that there are two such functions V_1 and V_2, then the function $U=V_1-V_2$ is zero on S and satisfies $\nabla^2 U=0$ within, hence by (1), $U=0$, that is, $V_1=V_2$, at all points within S.

29. Symbolic Vector Product $\nabla\times\mathbf{a}$— Curl of a Vector.— From (17) we have

$$\nabla\times\mathbf{a}=\left(\mathbf{i}\frac{\partial}{\partial x}+\mathbf{j}\frac{\partial}{\partial y}+\mathbf{k}\frac{\partial}{\partial z}\right)\times\left(\mathbf{i}a_1+\mathbf{j}a_2+\mathbf{k}a_3\right)=$$
$$\mathbf{i}\left(\frac{\partial a_3}{\partial y}-\frac{\partial a_2}{\partial z}\right)+\mathbf{j}\left(\frac{\partial a_1}{\partial z}-\frac{\partial a_3}{\partial x}\right)+\mathbf{k}\left(\frac{\partial a_2}{\partial x}-\frac{\partial a_1}{\partial y}\right).$$

It is shown in hydrodynamics that if $\mathbf{a}$ is the fluid velocity at (x, y, z), the vector just written represents double the molecular velocity of rotation at (x, y, z), or the vortex motion. This vector is called the curl of $\mathbf{a}$ even when $\mathbf{a}$ is not a velocity. When curl $\mathbf{a}=0$, the three components vanish, and these are the three conditions that a_1, a_2, a_3 shall be the partial derivatives of a function V, so that $\mathbf{a}=\nabla V$, where V is the scalar potential of $\mathbf{a}$. Thus the lines of $\mathbf{a}$ are normals to the family of level surfaces $V=C$, which divide the field into laminæ which are regarded as infinitesimally thin, and are hence called *lamellæ*. The magnitude of $\mathbf{a}$, that is dV/dn, varies inversely as the thickness dn of the lamella at (x, y, z), dV being constant; and any vector whose curl is zero is hence called a *lamellar* vector. Heaviside has given the name *divergent* to a vector whose curl is zero but whose divergence is not zero (as the velocity of a compressible fluid at a point where there is no vortex, or the electric force at a point where there is a charge) and the name *circuital* to a vector whose divergence is zero and whose curl is not zero (as the velocity of an incompressible fluid at a point where there is a vortex); a vector whose divergence and curl are both zero is sometimes called a *Laplacian vector;* it is both lamellar and solenoidal, as in the case of an electric field at a point where there is no charge. Helmholtz has shown that any vector field can be resolved into a divergent field and a circuital field. The curl of any vector is solenoidal, for $\nabla.(\nabla\times\mathbf{a})=0$ as in (17), or by differentiation. The curl of curl $\mathbf{a}$ is given by (20), that is

$$\nabla\times(\nabla\times\mathbf{a})=(\nabla.\mathbf{a})\nabla-(\nabla.\nabla)\mathbf{a}=\nabla(\nabla.\mathbf{a})-\nabla^2\mathbf{a}.$$

30. Relation between Curl and Circulation — Stokes' Theorem.— If AB is any arc in the field of $\mathbf{a}$, the line integral $\int_A^B \mathbf{a}\cdot d\mathbf{s}$ is called the *flow* of $\mathbf{a}$ along arc AB. When AB is a closed circuit, this integral is called the *circulation* of $\mathbf{a}$ around the circuit. Stokes' theorem asserts that this circulation equals the flux of curl $\mathbf{a}$ through any surface which caps the circuit; in symbols

$$\int \mathbf{a}\cdot d\mathbf{s} = \int\int \nabla \times \mathbf{a}\cdot d\mathbf{S}.$$

Sketch of Kelvin's proof: If S be ruled up into elementary areas, the circulation around the boundary equals the algebraic sum of the circulations about the elementary areas (by canceling flow on lines described in opposite directions); and similarly the circulation around any element dS at P equals the sum of its circulations around the three projections dS_1, dS_2, dS_3 on planes drawn through P parallel to the coordinate axes. Now if we take a parallelogram $PQRS$ with sides parallel to dx and dy, then the tangential components of $\mathbf{a}$ on the sides PQ, RS are a_1, $-\left(a_1 + \frac{\partial a_1}{\partial y}\,dy\right)$, and similarly for the other two sides, hence the algebraic sum of flow along the four sides is $\left(\frac{\partial a_2}{\partial x} - \frac{\partial a_1}{\partial y}\right) dx dy$. Summing this over dS_1, and taking similar sums over dS_2 and dS_3, we get the circulation around dS equal to $(\nabla \times \mathbf{a})\cdot d\mathbf{S}$; then integrating over the cap we get the circulation around the boundary.

As an application of Stokes' theorem, in fluid motion, the circulation around a circuit equals the sum of the strengths of all the vortex tubes enclosed by the circuit.

31. Circulation in Electromagnetic Circuit — Maxwell's Equations.— Faraday showed experimentally that the total electromotive force around a closed circuit (i.e., the line integral of the electric force $\mathbf{E}$) equals the negative of the time-rate of change of the total magnetic induction through the circuit; but this total induction is the surface integral of the magnetic induction vector $\mathbf{B}$ (x, y, z) taken over any surface that caps the circuit; hence Faraday's result may be written

$$\int \mathbf{E}\cdot d\mathbf{s} = -\frac{d}{dt}\int\int \mathbf{B}.d\mathbf{S};$$

and comparison with Stokes' formula shows that $\nabla \times \mathbf{E} = -\frac{d\mathbf{B}}{dt}$, which is Maxwell's equation for magnetic current in an electric field. Again Ampere's experiments prove that the work done in carrying a unit magnetic pole around a closed circuit equals 4π times the electric flux through the circuit, that is

$$\int \mathbf{H}\cdot d\mathbf{s} = 4\pi \int\int \mathbf{C}\cdot d\mathbf{S}.$$

Comparison shows that $\nabla \times \mathbf{H} = 4\pi\mathbf{C}$, where $\mathbf{H}$ is the magnetic force at (x, y, z), and $\mathbf{C}$ is the electric flux through unit area per unit time, i.e., the current density; this is Maxwell's equation for electric current in a magnetic field.

32. Vectors in a Plane — Quadrantal Versor.— Consider the vector $\mathbf{r} = i x + j y$, in the xy-plane, and perform the operation $\mathbf{k}\times$, then $\mathbf{k}\times\mathbf{r} = -jx + iy$; the operation repeated gives $\mathbf{k}\times(\mathbf{k}\times\mathbf{r}) = -ix - jy = -\mathbf{r}$, hence $(\mathbf{k}\times)^2 = -1$; and $(\mathbf{k}\times) = \sqrt{-1}$; each of these is a symbol for the operation of turning a vector through a positive right angle in the xy-plane, and is called *a quadrantal versor*.

33. Versor for Angle θ.— Writing $\mathbf{r}$ in the form $\mathbf{r} = r(\mathbf{i}\cos\theta + \mathbf{j}\sin\theta) = r(\mathbf{i}\cos\theta + \mathbf{k}\times\mathbf{i}\sin\theta) = r(\cos\theta + \sin\theta\,\mathbf{k}\times)\mathbf{i} = r(\cos\theta + \sqrt{-1}\sin\theta)\mathbf{i}$, we see that $\mathbf{r}$ can be derived from the unit vector $\mathbf{i}$ by applying the operator $r(\cos\theta + \sqrt{-1}\sin\theta)$, which is the product of the tensor r and the versor $\cos\theta + \sqrt{-1}\sin\theta$; this versor acting alone turns a vector through the angle θ without stretching. The product of the versor for angle θ and the versor for angle θ' is the versor for angle $\theta + \theta'$, thus $(\cos\theta + \sqrt{-1}\sin\theta)(\cos\theta' + \sqrt{-1}\sin\theta') = \cos(\theta + \theta') + \sqrt{-1}\sin(\theta + \theta')$. The complex algebraic number $x + \sqrt{-1}\,y$ can be represented by the versi-tensor $r(\cos\theta + \sqrt{-1}\sin\theta)$ where $r = \sqrt{x^2 + y^2}$, $\tan\theta = y/x$.

34. Vectors and Versors for Simple Harmonics.— Let the vector $\mathbf{r}_1$ revolve with angular velocity ω radians per second; then $\theta = \omega t + \theta_1$, where θ_1 is the value of θ when $t = 0$; and the x-component of $\mathbf{r}_1$ is $x_1 = r_1\cos(\omega t + \theta)$. Let another vector $\mathbf{r}_2$ revolve with the same angular velocity, starting at the position $\theta = \theta_2$, then its x-component is $x_2 = r_2\cos(\omega t + \theta_2)$. The vector sum (the diagonal of parallelogram) is $\mathbf{r}_3 = \mathbf{r}_1 + \mathbf{r}_2$ whose x-component is $x = x_1 + x_2 = r_1\cos(\omega t + \theta_1) + r_2\cos(\omega t + \theta_2)$; the diagonal $\mathbf{r}_3$ remains constant in length and revolves with angular velocity ω, hence its projection is of the form $x = r_3\cos(\omega t + \theta_3)$, a simple harmonic function of t with period $2\pi/\omega$; hence the sum of two simple harmonic functions with the same period and different phase angles is another simple harmonic of the same period, and its characteristic vector is the sum of their vectors. The phase angle θ_3 is found by adding the component vectors at time $t = 0$.

35. Time Derivatives of Simple Harmonics. — If $e = e_1\cos(\omega t + \theta)$, then $de/dt = -\omega e_1\sin(\omega t + \theta) = \omega e_1\cos(\omega t + \theta + \frac{1}{2}\pi)$, whose characteristic vector has the angle $\theta + \frac{1}{2}\pi$, and is represented (32) by $j\omega\mathbf{e}$, where $j = \sqrt{-1}$; similarly d^2e/dt^2 has the characteristic vector $j^2\omega^2\mathbf{e}$, that is, $-\omega^2\mathbf{e}$. This enables us to eliminate the time variable from differential equations involving simple harmonics of the same period, as in the theory of alternating electric currents.

Bibliography.— For further details and applications consult the treatises of Gibbs and Wilson (New York 1907); Coffin (New York 1911); Burali-Forti and Marcolongo (Bologna 1909); Bucherer (Leipzig 1905); also Heaviside, 'Electromagnetic Theory' (London 1894); Abraham and Föppl, 'Maxwellsche Theorie d. Elek' (Leipzig 1907).

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VEDA, vā'dą, the general designation of the ancient sacred literature of India. The word is from the Sanskrit root *vid,* "known," and signifies primarily "knowledge" or "science." It then came to be applied to the entire Hindu sacred literature as "*the* science." For a full discussion of the subject see the article on VEDIC LITERATURE. See also INDIA — *Religions.*

VEDANTA, vā-dän'tą, which means literally the end of the Veda, or knowledge, constitutes the most impressive and comprehensive structure of Hindu philosophy. It is not synonymous with Hindu philosophy, as is generally supposed, because the Vedanta is only one of the six main schools of Indian thought, one of which, the *Vyaya,* is for all practical purposes the earliest school of atheistic thought in the world. The subject of Vedanta is theistic thought, based on the texts of the Veda, principally *Upanishads.* The Upanishads are portions of the Veda, and are recognized to lead to the realization of self; they constitute the *Jnanakanda,* or the part dealing with higher knowledge, while the rest of the Veda, the Brahmana and Samhita, is known as the *Karmakanda;* or the part dealing with rituals. The foundation on which the philosophy has been reared is the *Sutras,* or the formulæ contained in the Vedanta Sutra, Brahma Sutra and the Sariraka Sutra. *Vyasa,* the author of the Hindu epic Mahabharata is said to be the author of the Sutras.

The Vedanta philosophy itself comprises several schools of thought, all of them, however, agreeing on the Veda as the final authority. A knowledge of the history of the philosophy is necessary to comprehend correctly the principles enunciated by the sages. The earliest speculative thought of the Hindus is contained in the Upanishads, which are at the same time extremely profound. There are 108 Upanishads; Vedantic thought, however, takes cognizance of but 18, although occasional references are made to some of the rest. In the gradual evolution of Hindu thought, these Upanishads came to a stage when the conclusion was arrived at that there was but one substance or reality, self-created, immutable, imperceptible, all-knowing and external. This is the supreme spirit, the impersonal self, the absolute, *ātman, paramātman, Brahman.* The *Brahman* is *Sachchidānanda,* i.e., life, thought and beatitude. It is life, as imparting life and manifestation to all that is known and appears to exist. It is thought, as being self-conscious, as giving consciousness to all, making appear all things that do appear. It is beatitude, as exempt from all the miseries of births and deaths, from evil, pain and sorrow, a beatitude in which there is no distinction between attribute and subject, a beatitude like the repose of dreamless sleep. Brahman is eternally pure, intelligent and free. It is pure, as free from loves and hates, passionless and unaffected by the limitations of form. It is intelligent, as irradiating all things, as illuminating the otherwise dark or unconscious modifications of the sensories and intellects of personal spirits, and as illuminating the objects of these modifications. It is free, as unaffected by the experiences of these spirits, exempt from the implication of the unreal.

Brahman, with all these attributes, had already been postulated in the Upanishads. The question of importance then was how to reconcile this postulate with existence. It is axiomatic that no speculation or philosophy is possible without admitting the existence of the individual, the universe which comprises everything else but the individual, and an entity that comprises and regulates all. All religions and philosophies, therefore, discuss the relations and inter-actions of the soul, the world and God. The meaning of existence, the purpose and aim of it, are to be sought in the understanding of the relations between the three known postulates.

All speculation starts with the individual, or individual soul, called *jivatman.* Therefore, the necessity of reconciling the individual soul with Brahman, which is the one reality, became imperative. Vedanta philosophy has also accepted from the outset that the soul is personal only in fictitious semblance, only so long as it is implicated in the series of transmigratory states, and is in truth impersonal, one with Brahman, and is in Brahman. As Krishna enunciates in the *Bagavad Gita,* its apparent and fictitious individuality, and its apparent action and suffering, are the individuality, the action and suffering of its illusory adjuncts, the organism and the faculties. The submergence of all souls into Brahman, the one soul, must be sought after and is the only truth. The true intrition, or the knowledge of Brahman is the sole method by which the parasitic growth of experience is pierced and the realization of self attained.

The earlier Vedic texts and the Sutras, which constitute the basis of the philosophy, were too vague for the practical inquirer; and being considered revelation, did not admit of doubt. Only two courses were open: either to reject them altogether or inject new thought into them by the aid of commentaries. The believer in the faith has no thought of rejecting what he considers divine revelation; so, the philosophy was built up of so-called commentaries or *bhashyas.* Every sage and philosopher, who had a system of thought to offer, claimed only to comment on the revelations; he took no credit for himself. It is no wonder, therefore, that European scholars and students should fall into the error of believing that the Vedanta is a single system of philosophy, somewhat on the lines of Plato or Epictetus.

There are three principal schools of Vedantic thought, *adwaita,* that which does not recognize the existence of a second, *dwaita,* that which recognizes two, and *Vishishtadwaita* or qualified dualism. The founder of the *adwaita* school was *Sankaracharya,* who lived about the 3d century of the Christian era. He enunciated that there was only one truth, i.e., Brahman. Existence, world and all differentiation was built out of *Maya,* or illusion. Maya is the principle by which the soul mistakenly identifies itself with fictitious adjuncts like the organs, faculties and the human organism. Out of maya is created the unreal world, and maya is the case of the projection of the manifold of experience. Sankaracharya held that name and form are illusions, neither existent nor non-existent, nor both in one, neither to be explained as an entity or as non-entity, fictitiously proceeding from, and to, all

eternity. The illustrations to prove the maya or illusion are very telling: Existence is like the blue sky, which has no existence or attribute, like the waters of a mirage, like the visions of a dream, like the snake seen by a dim light in a piece of rope.

Speculative thought in India has always been intimately connected with religion. Knowledge, *per se*, for no other purpose, had no place in Hindu philosophy. Hence, systems of philosophy are inextricably mixed up with a purpose; in the case of Vedanta, it is the release of the soul from ignorance and the attainment of the highest. The *summum bonum* of life, according to all schools of this thought, was to become one with Brahman. Sankara's system did not recognize duality; hence, maya or illusion only stands as a curtain between the soul and Brahman, which have ever been one. The moment the curtain is removed, there is an automatic absorption of the individual soul in the eternal.

While this school of thought was the earliest interpretation of the Sultras and Upanishads, it has not been popular. The doctrine of illusion, as preached by Sankara, was too abstruse for even the intellectuals. There was a hankering for a little more of the human touch in intellectual and religious speculation. A super-volitional Brahman had to give way to Brahman, which was the operative cause of the world. The transition did not involve any modification of the attributes; it was still immutable, omnipresent, omniscient and incorruptible. Only, Brahman had these attributes volitionally, and was not a residuum of abstraction. Brahman became the light of lights beyond the darkness, and by the light of Brahman all the world shone forth. Brahman had his abode within the heart. This process of reasoning led to the dualistic school of thought. *Ramanuja* was the originator of the new school, which, while admitting that the individual soul emanated from Brahman, and was part and parcel of it, contended that it was still a distinctive entity. Even salvation was not the annihilation of the individual soul, although it was held to mean "to become one with Brahman." Ramanuja admitted the existence of *Maya* or illusion; but he used it to signify wrong perception, and not the perception of existence in non-existence. Sankara exalted knowledge as the means to Salvation; but Ramanuja relegated it to a secondary place, placing "faith" on a higher plane. He exalted the doctrine of the attainment of salvation by faith, and incorporated it in his system of philosophy. His school is known as *Visishtadwaita*, or qualified dualism. According to him, Brahman is the operative cause of the world, and the process of evolution by which existence is regulated is called "differentiation under name and form." The process moves in cycles from eternity to eternity, evolution and dissolution chasing each other in an endless circle. As plants proceed from seeds and seeds from plants, so embodiment proceeds from works and works from embodiments. This series continues until each individual soul realizes itself, and finds eternal bliss and repose in the bosom of Brahman. Salvation is not absorption and negation of existence to the individual soul, but the attainment of bliss in Brahman.

This doctrine was not altogether new, as it had already been foreshadowed in the earlier texts. Just as Sankara emphasized the aspect of absorption in Brahman, which was also indicated in the Sruti, so Ramanuja emphasized the doctrine of individuality.

The third school is known as the *Dwaita*, or dualism, the founder of which was *Madhava*, who lived in South India about the 14th century. Madhava regarded Brahman, or the all-pervading soul, and the individual soul as distinct entities. Salvation, according to him, was the attainment of eternal bliss by the individual soul, with the aid of Brahman. Excepting this modification, his teachings were no more than a medley of the two prior schools of Vedanta. He made his thought popular by appealing to the masses.

Besides the above three principal schools of Vedantic thought, there have been numerous other systems, which have exercised local influence — the only ones worth mentioning being the systems of *Nilakanta* and *Ramananda*.

As has already been mentioned, Vedanta is not pure speculation. Being a theistic system of philosophy, it is inextricably connected with cosmogony as well as practical conduct of life. Ethics is not specially emphasized in any system of Hindu philosophy, because ethical conduct is an axiom, which inevitably follows from the acceptance of Veda as revelation and the foundation of knowledge. None but the pure can study the Vedas; and none but those conversant with the Vedas can be students of Vedanta. Enquiry into the origin and processes of existence are motivated by the need of the individual to attain salvation. Knowledge for the sake of knowledge has no place in the systems of philosophy built up by the Hindus; and knowledge for any other purpose but salvation is anathematized. Therefore, Vedanta had to work up a rule of conduct for life, aiding toward the attainment of salvation. In the earlier stages of Hindu evolution, great stress was laid on ceremonial rites and the paraphernalia of sacrificial offering to the deities. The Vedantists rejected this rule altogether as tending toward the lowering of the soul; they preached the doctrine that salvation was to be attained by contemplation. Once again, they omitted all references to ethics, because they took it as axiomatic that only these that are pure in thought, word and deed are fit for meditation. The aspirant to salvation must constantly meditate on Brahman, until he attains freedom from the bondage of existence.

The belief in metempsychosis or transmigration of souls plays a great part in Vedanta. This philosophy, or the elaboration of it, owes its existence to Buddhism. Buddha revolted against ceremonial Hinduism, and emphasized ethical conduct and contemplation. He frankly held that life was synonymous with misery and bondage, and that humanity must forever seek to emerge from the bondage in order to attain salvation. He took the text of the Vedas, enunciating the oneness of life and nature, to promulgate his doctrine of transmigration. The soul had to have a sheath in order to be part and parcel of existence. What difference did it make if it was in the hide of an elephant or the epidermis of a man? The idea was further developed in order to form gradations of life. A hierarchy was formed. The soul was

said to pass through every stage of life from rocks and vegetables to fish and animals, before it was allowed to be born in a human garb. He emphasized the necessity for ethical conduct by offering a higher form of existence as reward for virtue and a lower one as punishment for vice. Escape from existence was salvation, and only by pure life, austere deeds and contemplation was a soul enabled to throw off the sheath altogether, and attain *Nirvana,* or eternal bliss. Hinduism had to take this doctrine and incorporate it within itself in order to fight the spread of Buddhism in the country. It was not averse to do so either, because it easily found sanction for it in the Vedas. Moreover, this offered the best explanation for the inequalities of life, and gave hope to all sentient creatures of attaining salvation some day.

Vedanta took this thought up cheerfully, and elaborated it. The inquiry into the fundamentals and motives for existence was facilitated by the belief in metempsychosis. It disposed of the question: Where is the need for salvation? There was, however, a slight modification of the doctrine, as recognized by Vedanta. It did not agree with Buddhism that life was misery; it was certainly bondage, but a bondage which was consistent with the eternal law and will of Brahman. The supreme law or will of the Divine enjoined a constant process of evolution and dissolution. Brahman, overspread with illusion, manifests itself as Isvara, who allots to transmigrating spirits their several bodies and spheres of fruition, in accordance with the law of retribution, i.e., the spirits obtain the bodies they have merited by their own acts. Everything that exists, elements, sentiency, soul and sheaths has ever existed. There is no creation. It is the will of Brahman that at the end of each *Manvantara* or cycle, all differentiation vanishes, and souls and elements become one with him. Brahman retracts them all unto himself at the dissolution of the æon.

The individual soul, however, can extricate itself from metempsychosis, and be above the law as the Brahman itself. To do so it must receive its proper nature; the man must purify his intellect, by passing through several lives. «Not he that has not ceased from evil, not he that rests not from sensations, not he that is not concentrated, not he whose faculties are not quiescent, can reach that self by the intuition» attainable through Vedanta. By continuous contemplation, the aspirant to salvation works against the order of evolution until he attains to the Brahma. He then becomes extricated from bodies, but lives and becomes a *Jivanmukta.* When he attains this stage, he is untouched by merit or demerit. The body then falls away, and the spirit is freed for ever with undifferentiated existence, undifferentiated intelligence and perfect beatitude.

The Vedantic doctrine of ethics is different to that of ritualistic or popular Hinduism; as a matter of fact, it is different from those of all known religions. Vice and virtue, in their essence, are purely relative; to the adept they do not exist at all. The manifestation of Brahman comprises all attributes of existence; all that exists, therefore, is in accordance with divine purpose. To the being that is untrammeled by the bondage of existence, the differentiation becomes unreal.

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VEDDER, vĕd'ẽr, **David,** Scottish poet: b. Deerness, Orkney, 1790; d. Edinburgh, 11 Feb. 1854. He went to sea when very young, became captain of a whaler at 22, was appointed first officer of an armed cruiser in 1815, and in 1820 became tide-surveyor, an office he occupied until his retirement on a pension in 1852. He appears to have written poetry at an early age, but his first published verse was 'The Covenanters' Communion, and other Poems' (1828). His poetry is graceful and fluent, and possesses both humor and pathos. His work includes 'Orcadian Sketches' (1832); 'Life of Sir Walter Scott' (1832); 'Poems — Legendary, Lyrical and Descriptive' (1842); 'Story of Reynard the Fox' (1852), etc.

VEDDER, Elihu, American painter and modeler: b. New York, 26 Feb. 1836. He studied painting with Mattison at Sherburne, N. Y., and in 1856 became a pupil of Picot in Paris. In 1857–61 he worked in Italy, then returned to the United States, where he found himself disqualified for enlistment as a soldier by a defective arm. Returning to Paris in 1865, he remained there till January 1867, when he went to Rome, where he has since resided. His subjects are mostly ideal, and his work is characterized by great imaginative power and originality, with boldness and intensity of expression, qualities which impart to it a heroic cast. His oil paintings include the 'Phorcydes'; the 'Cumæan Sibyl' (see CUMÆ); 'The Greek Actor's Daughter'; 'Roman Girls on the Seashore'; 'Venetians on the Main'; 'The Lair of the Sea-Serpent'; 'The Roc's Egg'; 'The Crucifixion'; and others. His reputation was greatly increased by his illustrations of Edward Fitzgerald's 'Omar Khayyám' (1884), and his decorations, subsequent to 1892, are marked by his significant characteristics. Examples of his work in this style may be seen in the pieces called 'Good and Bad Government' in the Library of Congress, Washington, and in a panel which he executed for Bowdoin College.

VEDDER, Henry Clay, American Baptist church historian: b. De Ruyter, N. Y., 26 Feb. 1853. He was graduated from the University of Rochester in 1873 and from the Rochester Theological Seminary in 1876. He was associate editor of *The Examiner* 1876–92, and editor-in-chief 1892–94; and also edited *The Baptist Quarterly Review* (1885–92). Since December 1894, he has been professor of church history in Crozer Theological Seminary, at Chester, Pa. Among his published works are 'Baptists and Liberty of Conscience' (1883); 'The Decline of Infant Baptism' (1890); 'A Short History of the Baptists' (1891); 'American Writers of To-day' (1894);

'The Decline of the Apostolic Succession in the Church of England' (1894); 'A History of the Baptists of the Middle States' (1898); 'The Baptists' (1903).

VEDIC (vā-dĭk or vē'dĭk) **LITERATURE,** the literature of the Vedas or sacred books of India. The language and literature of the Aryan invaders of India falls into two periods, the Vedic and the Sanskrit. Vedic is the English adjective formed from the noun *veda,* the native name for the literature. This word means "knowledge" (*vid* seen in Greek *Fίδμεν* "we know," Latin *videre,* Gothic *witum,* "we know," English *wit*), which specializes in the sense of "the knowledge par excellence," "the sacred knowledge" in a way comparable with our designation of our sacred Scriptures as "the book," the Bible. This fact indicates at once the character of the literature. It is a religious literature, composed to meet the various needs of a complex religious system, and is consequently practical, not artistic in purpose.

The people among whom this literature originated were Indo-Europeans, who had entered the peninsula of India from the northwest. At the beginning of the Vedic period they were settled on the Indus and in the Punjab, and throughout the period the course of their conquests can be followed eastward across the Jumna to the valley of the Ganges. Owing to the uncertainty of all Indian chronology it is rarely possible to give exact dates to any monument of its literature. For the Vedic period this is especially true, the best that can be done is to fix the relative succession of certain classes of writings. The oldest works are collections of material, the composition of which must have extended over several centuries. For the oldest of these, the Rig Veda, the estimates of competent scholars vary from 4000 to 1000 B.C.— about 2000 B.C. being a conservative estimate. The close of the Vedic period may be approximately given as shortly before the beginning of our era.

These people were worshippers of the various phenomena of nature, of which their chief deities were anthropomorphic precipitates (for details see Hopkins, 'The Religions of India,' Boston 1898, and the literature there cited). To these gods they offered sacrifices that they might give in return prosperity — rain, wealth in cattle and in sons, health, long life and finally safe escort to the kingdom of the dead where ruled Yama, the son of Vivasvant. They conceived also the idea that these material gifts could be made more acceptable to the gods, if accompanied by songs of praise and invocations that extolled the might of the gods and told of their wondrous works; that formulæ of magic potency were also employed is but natural. The very form of the invocations implies the existence of mythological legends, and it is inconceivable that so elaborate a ritual as existed at the time of the Rig Veda and even earlier in the Indo-Iranian period, could have been introduced and maintained without some tradition of the reasons for its existence, and directions for its proper performance. In short, in this earliest period we have existing side by side all the germs which developing at a later period and crystallizing at various times precipitated themselves in the three great types of Vedic literature, the Saṁhitās, Brāhmaṇas and Sūtras.

The religion had two aspects, a hieratic and a popular side. The first comprised the greater Vedic ceremonies, the so-called *çrāuta*-sacrifices and centred about the oblation of the intoxicating drink *soma;* the second comprised besides the rites connected with the home life the *gṛhya* rites — (from *gṛha,* "a house"), the practices that were more distinctly magical in nature, whose objects were to bless and to curse. It remains to be noted that with the growing power of the priesthood, their influence reached out over this sphere also and gave to these originally popular ceremonies a quasi-hieratical character. From this follows the partition of the Vedic literature into two main subdivisions, on the one hand the *trayī vidyā,* the "three-fold knowledge" of the hymns of praise, the Rig Veda, of the chanted songs, the Sāma Veda, and of the sacrificial verses and formulæ, the Yajur Veda, with their Soma sacrifices, and on the other, the Atharva Veda, and the house ceremonies.

The performance of the great *çrāuta* sacrifices required the participation of three classes of priests, the Hotar, or the reciting priest, the Udgātar, or the chanter, and the Adhvaryu, to whose lot fell the performance of the manual labor of the ceremonies. To this corresponds the tripartite division of the hieratic literature for the Veda of the Hotar is the Rig, that of the Udgātar is the Sāma, and that of the Adhvaryu, the Yajur Veda. In each Veda three main classes of works exist, the Saṁhitās, Brāhmaṇas and Sūtras; and within each Veda these types follow one another in this order, for the Brāhmaṇas presuppose the Saṁhitās, and the Sūtras the Brāhmaṇas. But it does not follow from this that the composition of all the works of one type belongs to the same period. So that it is misleading to speak of a Brāhmaṇa or Sūtra period and attempt to define them as if there had ever been a period in which, for example, the Brāhmaṇas and nothing else were composed. Besides there existed in each Veda different schools (*caraṇas*), varying more or less from one another. Sometimes the difference consisted only in details of the ritual, sometimes in the theological exposition of its meaning, sometimes it extended to the Saṁhitās themselves. In the latter case the result is various recensions of the same Saṁhitā known as *çākhās* ("branches"). In the former cases the differences lead to the composition of different Brāhmaṇas and Sūtras belonging to the same Veda.

The Saṁhitās (from *sam,* a preposition comparable in meaning with *συν* and *√dhā,* "to put," which appears also in *τίθημι*) are collections made from this floating mass of lyric material and sacrificial formulæ. To them the term Veda is frequently applied in a narrower sense, so that, for example, Rig Veda may mean either the Rig Veda Saṁhitā, or that Saṁhitā together with all the works of other classes dependent upon it.

The Rig Veda (from *ṛc,* a laudatory stanza, especially one that is to be recited in opposition to one that is to be sung) is the oldest and most important of these collections. It contains a little over 1,000 hymns, that consist of about 10,000 stanzas, and so are in bulk a little

less than the Iliad and the Odyssey together. The hymns are religious lyrics of evidently very diverse origin and of correspondingly unequal literary merit. The mass of them, however, are directed alike to the greater gods of the Vedic pantheon, extolling their deeds, imploring them to come to the sacrifice, accept the offerings and grant blessings to their worshippers. It is from this material that the Hotar forms the Canon of the hymns that are required at each *çrāuta* sacrifice. But as the order of hymns does not follow the order of their employment in the ritual, and as the collection contains also material — for example, the funeral and wedding stanzas — not intended for this purpose, it becomes evident that the primary purpose of the collection was not to furnish a manual for the Hotar. It has, therefore, been assumed that the purpose of the collection was historic and scientific — to preserve a body of poetry the value of which was appreciated — and some of the hymns have been interpreted as secular poetry. Later investigations, however, go to show that these hymns also are religious, and that the Rig Veda itself is a collection of mantras intended for a ritual different from the system afterward expounded in the Brāhmaṇas and Sūtras.

The hymns are distributed into 10 books, but the different principles of arrangement observable in them show that the collection is the expansion of a still earlier collection. With regard to its tradition,— the text of the hymns had evidently suffered a number of corruptions before they were brought together in the present collection. The formation of the latter antedated not only the composition of the Brāhmaṇas, but also the formation of the other Saṁhitās — the time of the redaction of these Saṁhitās must, however, be carefully distinguished from the time of composition of the material contained in them. From this time on the utmost care was bestowed upon the preservation of the text, and these efforts attained upon the whole a wonderful success. An exception is to be made for the work of certain scholarly redactors — the close of whose activity falls between the composition of the Brāhmaṇas and the time of Pānini, who modernized the text to a certain extent chiefly by forcing upon it the observance of the later laws of *saṁdhi*,— the rules that govern the contact of words in a sentence. From their hands issued the Saṁhitā text. For its protection was composed the Pada-pātha, or "word text," which attempted to undo the effects of the laws of *saṁdhi* and give each word in its original form. Still more elaborate precautions of a similar nature were the Krama-pāṭha, or "step text," the Jaṭā-pāṭha, or "woven text," and the Ghana-pāṭha. Further safeguards were certain phonetic treatises, the Prātiçākhyas, to be mentioned below. The result has been that we have the Saṁhitā text, as it came from the hands of its redactors, and as the changes made by them can generally be detected by disturbances of the metre, we can restore the collection to essentially the form in which it previously existed. Of different *çākhās* of the Rig Veda only one has been preserved, that of the *Çākalas*.

The Sāma Veda (from *sāman*, a chant) is a collection of the words to be used by the Udgātar at the *soma* sacrifice. It contains 1,549 stanzas, all except 75 of which occur also in the Rig Veda. Historically, therefore, it is the least important of the Saṁhitās. In accordance with the purpose of the Sāma Veda they stand not in their original context but in the order of their liturgical employment. The Saṁhitā exhibits these verses simply in the form of the stanzas (*ṛcas*) that form the basis of the melodies. They acquire their proper character of Sāmans only in the Gānas or song books, where the prolongations, repetitions and additional syllables required by the music are noted. As each stanza could be chanted in a great variety of ways, the number of Sāmans is practically unlimited. The text has come down to us in the recensions of two schools, namely, the Raṇāyanīyas and the Kāuthumas, while of the song books four are known, namely, the Grāmageyagāna, the Āraṇyagāna, the Uhagāna, and the Uhyagāna.

The Yajur Veda (from *yajus*, a liturgical formula) is, as its name denotes, a collection of the sacrificial hymns and formulæ and primarily those of the Adhvaryu. Like the Sāma Veda, it follows in its arrangement the order of the ritual, but it is broader in the scope of its material, for the Sāma Veda is limited to the treatment of the *soma* sacrifice, while the Yajur extends to the other *çrāuta* sacrifices also. It is the Veda in which the school differences are most noticeable. The two great divisions are the White and the Black Yajur Vedas. The difference being that the Saṁhitā of the former is merely a collection of *mantra* material, while the Saṁhitā of the latter contains not only this material which properly belongs is a Saṁhitā, but also a certain amount of theological exposition which should properly be in the Brāhmaṇa. Of the White Yajur Veda we have two recensions, those of the Mādhyaṁdinas and the Kānvas. The Black Yajur Veda exists in the following recensions: the Tāittirīya Saṁhitā, the Māitrāyaṇī Saṁhitā, the Kaṭhaka Saṁhitā, and the Kapiṣṭhala-Kaṭha Saṁhitā.

The Brāhmaṇas (relating to *brahman*, "religious formula") are theological treatises concerned chiefly with the ritual of the sacrifice. They do not systematically describe the ritual, for they presuppose a knowledge of it, and also a knowledge of the *mantra* material of the Saṁhitā. Their object is to explain the mutual relationship of these two elements — rite and formula. This involves exegesis of the *mantras* and leads to the telling of many myths. Furthermore, as they are concerned not only with the external relationship of the ceremony to its formulæ but much more with its internal relationship (for to the Hindu what a thing is, is never of as great importance as what the thing symbolizes), they contain masses of theological and philosophical speculations frequently of the most fantastic mysticism. In form they are throughout in prose, except for certain peculiar parts imbedded in them called the Gāthās. Appended to them are certain works of a theosophical character — called the Āraṇyakas or Forest Books, because owing to their peculiar mystic sanctity they could safely be transmitted from teacher to pupil only in the seclusion of the forest. The Upaniṣads ("confidential sessions") are esoteric

philosophical speculations concerning chiefly the nature of Ātman or Brahmā, the world-soul. They are also called the Vedānta, that is, "end of the Veda" either because of their position or as their adherents insist in the sense of the "final goal of the Veda." Now each of these Brāhmaṇas attaches itself to one of the Saṁhitās and accordingly treats only of the portion of the ritual in which the corresponding priest is engaged. According to this principle they are classified: (1) Belonging to the Rig Veda; the Āitareya Brāhmaṇa and the Kāuṣītaki or Çāṅkhāyana Brāhmaṇa to each of which is attached an Āraṇyaka and an Upaniṣad of the same name. (2) Brāhmaṇas belonging to the Sāma Veda. Of these we have the Pañcaviṅça Brāhmaṇa, so called from its consisting of 25 books with its supplement, the Ṣaḍviṅça Brāhmaṇa; the Chāndogya Brāhmaṇa with its Upaniṣad, and the Jāiminīya Brāhmaṇa containing the Kena Upaniṣad. Four other works belonging to this school, the Sāma-Vidhāna Brāhmaṇa, the Devatādhyāya Brāhmaṇa the Vaṅça Brāhmaṇa, and the Saṁhitopaniṣad are Brāhmaṇas only in name. (3) For the White Yajur we have the Çatapatha Brāhmaṇa in two recensions, corresponding to the two recensions of the Saṁhitā. (4) For the Black Yajur Veda the Brāhmaṇa material is already imbedded in the Saṁhitā, but there also exist as independent works the Tāittirīya Brāhmaṇa, and Āraṇyaka, the latter containing two Upaniṣads in addition to which there are the Kāṭhaka and the Māitrāyaṇa Upaniṣads.

The Sūtras ("threads" or "clues") are compendiums of practical rules for various subjects. Stylistically works of this class are characterized by the utmost endeavors for conciseness. The extent to which these efforts were carried is shown by the aphorism that an author should rejoice more over the saving of half a long vowel than over the birth of a son — on which depended his happiness in the next world. The name is frequently applied in a narrower sense to the Sūtras that treat of religion, the so-called Kalpa Sūtras. The greater part of these Sūtras fall into two classes, the Çrāuta (relating to *çruti*, revelation) Sūtras which deal with the elaborate ceremonies for the performance of which three fires are required and the services of a number of priests; and the Gṛhya (from *gṛha*, "house") Sūtras which deal with the simpler observances of daily life that are performed by the householder himself in the house fire. Each Sūtra attaches itself to a particular Saṁhitā. In the case of the Çrāuta Sūtras this connection is evidenced by their limiting themselves to the duties of the corresponding priest so that a complete picture of the sacrifice can be gained only by the combination of several Sūtras; for the Gṛhya Sūtras the connection is not so close. All treat of essentially the same subjects, but each draws its mantra material as far as possible from its own Saṁhitā. The following Sūtras have been preserved: for the Rig Veda, the Çāṅkhāyana, Çrāuta Sūtra, and the Āçvalāyana Çrāuta Sūtra, and two Gṛhya Sūtras of the same name; for the Sāma Veda, the Çrāuta Sūtras of Maçaka, Lāṭyāyana and Drāhyāyana, and the Gṛhya Sūtras of Gobhila and Drāhyayaṇa; for the White Yajur Veda the Çrāuta Sūtra of Kātyāyana, and the Gṛhya Sūtra of Pāraskara; for the Black Yajur Veda the Çrāuta Sūtras of Āpastamba, Hiraṇyakeçin, Bāudhāyana and Bhāradvāja, also the Mānava and the Vāikhānasa Çrāuta Sūtras. To each of these is a corresponding Gṛhya Sūtra and also the Kāthala Gṛhya Sūtra.

This summary of the hieratic literature has included in the Gṛhya Sūtras one side of the popular religion. In them, however, we have the popular ceremonies as developed, systematized and codified by the Brahmans. Moreover, they represent the Hindu only in the natural course of his life and in his orderly and lawful desires. Fortunately the picture is completed by the Atharva Veda; so that we have a knowledge of the private life of the Hindu with a fullness of detail that is not equaled by the records of any people of a similarly remote period.

Of the Atharva Veda Saṁhitā two *çākhās* exist: one of these, the Pāippalāda, has been preserved only in a single manuscript and has only recently become generally accessible; the other that of the Çāunaka school has been carefully edited and extensively studied. It consists of a little over 700 hymns of about 6,000 stanzas divided into 20 books. Of these the last two are later additions, one being taken chiefly from the Pāippalāda Çākhā, the other from the Rig Veda. Books 13–18 are devoted to special subjects; the other books contain charms for the cure of various diseases frequently regarded as possession by demons; prayers for long life and health; imprecations against demons, sorcerers and enemies; charms pertaining to women; charms to secure harmony and influence in the assembly; charms pertaining to royalty; prayers and imprecations in the interest of the Brahmans; charms to secure prosperity; charms in expiation of sin and defilement; cosmogonic and theosophic hymns and ritualistic hymns. In short the Atharva touches the interests of every class of life and ranges from the highest metaphysics of theosophic mysticism to the lowest bathos of sorcery. The redaction of this material is later than the redactions of the other Saṁhitās and probably later than the composition of some of the Brāhmaṇas. The material itself is of widely different ages; some of it cannot be much older than the time of the redaction; other parts may be among the earliest products of Vedic literary activity as some of the practices go back even to Indo-European times.

The subordinate literature of the Atharva was evolved in an order diametrically opposite to that of the other Vedas. The oldest work is the Kāuçika Sūtra, which gives the ritual for the employment of these hymns and has its closest analogies in the Gṛhya Sūtras. Later the Atharvans advanced the claim that their Veda was the fourth Veda, the Sarvā Vidyā or "complete knowledge" that always loomed up behind the consciousness that each of the other Vedas was only the fraction of a greater unit; that this was the Veda of the fourth priest, the Brahman, who exercised a general supervision of the sacrifice, and consequently that this important office could be filled only by an Atharvan; finally that the Purohita or house chaplain of the king must be a member of their school.

To support these claims were needed works treating of the duties of the Brahman such as existed for the other priests in the other Vedas. Accordingly there were composed the Vāitāna Sūtra (a Çrāuta Sūtra) and the Gopatha Brāhmaṇa. Furthermore a large number of Upaniṣads came to be attached to the Atharva.

A complete Kalpa Sūtra contains also a Dharma Sūtra, or a collection of aphorisms on the law, chiefly from its religious side. Those of Āpastamba, Hiraṇyakeçin and Bāudhāyana — all belonging to the Tāittirīya division of the Black Yajur Veda — have been preserved; the Dharma Çāstras of Gāutama (Sāma Veda) and Vasiṣṭha (Rig Veda) are in reality also Dharma Sūtras. Kalpa, however, is only one of the six Vedāṅgas or "limbs of the Veda" into which tradition divides the whole Sūtra literature. The others are *çikṣā*, "pronunciation"; *chandas*, "metre"; *vyākaraṇa*, "grammar"; *nirukta*, "etymology" and *jyotiṣa*, "astronomy." The beginnings of these sciences generally go back to the Brāhmaṇas; in the Sūtras they are elaborated and then flourish in the post-Vedic period. Of special works are to be mentioned the Prātiçākhyas "relating to the Çākhā," or phonetic treatises, whose object is to explain the relationship of the Saṁhitā and Pada-pāṭha texts. For grammar the great work is that of Pānini, which as the norm of the classic language requires fuller treatment under that head. Etymology is represented by Yaska's Nirukta. The Sūtras are completed by the Pariçiṣṭas or Supplements. Finally there are the Prayogas, "manuals" and Paddhatis, "guides," that give a more connected picture of the sacrifice and indices called Anukramiṇīs that treat the literature from various points of view.

Bibliography.— The best work of reference on all subjects connected with India is still in course of publication: 'Die Grundrisse der Indo-Arischen Philologie und Altertumskunde, begründet von Georg Bühler, fortgesetzt von F. Kielhorn' (Strassburg 1896). It contains the fullest citation of the literature of the subject. Many of the texts have been translated into English in 'The Sacred Books of the East,' edited by Max Müller, Oxford. In English there are the translation of Weber, 'History of Indian Literature' (3d ed., London 1892); and of Kaegi, 'The Rig Veda' (Boston 1886); also 'A History of Sanskrit Literature,' by A. A. Macdonell (New York 1900); Bloomfield, M., 'The Religion of the Veda' (New York 1908); and Keith, A. B., 'The Religion and Philosophy of the Veda' (Cambridge, Mass., 1917), all of which give besides a treatment of the subject a fuller bibliography.

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VEEN, vān, **Otto van** (called "OTTO VENIUS"), Dutch painter: b. Leyden, 1558; d. 1629. His father was burgomaster of Leyden in 1572, and remaining faithful to Philip II his property was confiscated and he was driven to Liège with his son Otto, who there began the study of painting under Lampronius. In 1575 he became a pupil of Federigo Zucchero in Italy. He appears in Liège as page to Ernest de Bavière in 1580 and is sent on a diplomatic mission to the emperor. At Antwerp Rubens became his pupil in 1592 and he was made dean of the Guild of Saint Luke in 1602. He was a fine poet as well as a brilliant painter. His historical pictures and portraits are marked by strictness of design, natural attitudes and the most expressive faces, while the coloring is brilliant, though never attaining to the gorgeous and transparent lustre of his pupil Rubens.

VEERY, or **TAWNY THRUSH,** a small migratory thrush (*Turdus fuscescens*) of eastern North America. The veery ranges from the Rocky Mountains eastward, chiefly within the United States and nests throughout the northern part of its range. It is uniform cinnamon brown above and with very little spotting or marking underneath. The usual call note is a very clear whistle, *wheèn*, easy to imitate. The song is much less frequently heard, but is very attractive, though so peculiar as to be quite characteristic. The nest is built on or near the ground, chiefly of bark, rootlets and leaves, and the four or five eggs are bright greenish-blue, unspotted. The veery is decidedly a woodland bird, preferring damp woods with considerable underbrush.

VEGA, vā'gā, Garcilaso. See GARCILASO DE LA VEGA.

VEGA CARPIO, vā'gā kär'pē-ō, **Felix Lope de,** Spanish poet and dramatist: b. Madrid, 25 Nov. 1562; d. there, 26 Aug. 1635. After studying at Alcalá he joined the army, and in 1588 accompanied the Invincible Armada. About 1612 he became a priest, and subsequently Pope Urban VIII made him a Knight of Malta and a doctor of theology. He had already written and published various poems, but his productions were now multiplied with extraordinary rapidity. Scarcely a year passed in which he did not print a poem, and in general scarcely a month, or indeed scarcely a week, passed in which he did not produce a piece for the theatre. He informs us that he had more than a hundred times composed a piece and brought it on the stage within 24 hours. The fame that he enjoyed during his lifetime was immense. The people idolized him, and he received marks of distinction from the king of Spain and Pope Urban VIII. The latter, in return for the dedication of a tragedy on Mary Stuart, conferrred on him the title of doctor of theology and sent him the cross of the order of Malta. The profits that accrued from his works corresponded to his fame. About 450 of his dramatic productions have been printed. They reveal an inexhaustible but ill-regulated imagination, a strange mixture of the beautiful and the ridiculous, the sublime and the trivial, a rare mastery of dialogue and extraordinary facility in versification. He has been described, probably with more epigrammatic force than strict accuracy, as the dramatist who has written the greatest number of good scenes and the greatest number of bad pieces. The Spanish Academy began a collection of his works in 1893. (See STAR OF SEVILLE, THE). Consult Lord Holland, 'Some Account of the Life and Writings of Lope Felix de Vega Carpio' (1806–17); Ticknor, 'History of Spanish Literature' (Vol. II, 1849; 6th Am. ed., 1888); Lewes, 'The Spanish Drama: Lope de Vega and Calderon' (1846); Forster, 'Some French and Spanish Men of Letters' (1891); Farinelli, 'Grillparzer

and Lope de Vega' (1894); Ludwig, 'Lope de Vega's Dramen aus dem Karolingischen Sagenkreise' (1898); Wurzbach, 'Lope de Vega' (1898).

VEGETABLE FIBRE. See FIBRE.

VEGETABLE IVORY, a hard, fine-grained, white substance which is the reserve cellulose stored in the cell-walls of the endosperm of the fruits of a species of *Phytelephas,* a genus of Central American palms (q.v.). The stems recline upon the ground for a few feet, and then are crowned with long, linear, plume-like, pinnate leaves, arching upward for 20 or 30 feet. The fruits lie near the ground, are globular, about as large as a man's head, and consist of several drupes, enclosed in a woody, wart-covered wall. The kernels of the drupes, or seeds, are about the size of a hen's egg, and when very young contain a clear, insipid fluid, which is used instead of water by travelers. As in the cocanut, this fluid becomes milky and sweet-flavored, and the nuts are eagerly eaten in this stage by sundry animals, but continue to thicken and harden, until, when fully ripe, the seeds are so very hard as to form a valuable substitute for elephant ivory. These seeds are known to commerce as ivory-, or corozo-nuts, and are extensively used in making small articles of turnery, as buttons, umbrella-handles and the like.

VEGETABLES, Food Value of. The function of food is to build up the tissues of the body and keep them in repair, to yield energy in the form of heat, to keep the body warm and to create strength to enable it to do its work. A diet to accomplish all this must contain the nutrients, water, nitrogenous substances or proteids (classified as protein), also fats, carbohydrates (sugar, starch, cellulose, etc.), and mineral matters, such as sodium chloride (common salt) and phosphate of lime. Animal foods, meat, eggs, cheese, etc., are rich in protein, but not in carbohydrates. With the exception of butter, lard and the fat of pork, they yield but little heat and as a rule should be associated with other foods to form a complete diet. Cereals (corn, wheat, etc.), on the other hand, though classed among the vegetable foods, furnish a very large proportion of the actual nutrients in the ordinary diet and more economically than animal foods, for which they may be substituted. Combined with milk, fruit and nuts, they form a complete diet. Vegetables as a rule are deficient in fat and protein, but rich in carbohydrates and some of them contain beneficial juices and salts. While a vegetable diet is often of great service in neurasthenia, gastric neurosis, etc., for healthy persons the objections to a strictly vegetable diet are based upon the large amount of material required to furnish necessary protein, the amount of residue to be got rid of by the body and the monotony of the diet. Most of the so-called vegetarians are merely non-meat-eaters, for they consume milk, butter, eggs, cheese and sometimes fish. The fact is that man is an omnivorous animal, his digestive apparatus is adapted for the digestion of both animal and vegetable foods and usually he needs both in moderation. Vegetables are too often considered merely as a pleasant addition to the diet and not a necessity. Most families use but 12 or 15 different kinds of vegetables, whereas the large markets in our cities have for sale throughout the year about 50 varieties. The United States government has recently encouraged the increased use of vegetables and through investigations and experiments has added to our knowledge of their food value. For example, the purslane and other so-called weeds have been found to be useful as food and the propagation and use as food of the roots, tubers, beans, bulbs and various plants heretofore grown and used as food almost exclusively by the Chinese, such as lily bulbs, the lotus, taro and ginseng, are recommended to Americans. The malates, citrates and other salts found in certain vegetables are indispensable in food as they are converted into carbonates in the body and furnish some of the alkalies to the blood and other fluids. Potatoes, onions and fresh salad vegetables, such as tomatoes, cabbage, greens, lettuce, corn and cucumbers are excellent preventives of scurvy (q.v.) and in the spring, after the heavy winter diet (more or less of meat) their juices and salts are especially beneficial. These vegetables, together with oranges, lemons, limes and apples, may well be substituted for so-called spring medicines. Vegetables are also needed for their bulk, which is an important adjuvant in maintaining the necessary movements of the intestines.

Much of the indigestion following the use of certain vegetables is due either to insufficient cooking or to the fact that the vegetables are not fresh. The Irish potato, the "king of vegetables," lacks protein, fat and salts and should be eaten with butter and salt, pot liquor, meat gravy or fat meat and associated with some nitrogenous food. The legumes, beans, peas and lentils differ from other vegetables by reason of the large amount of protein they contain, as well as mineral matter, chiefly lime and potassium salts, but fat is needed with them to furnish the necessary nutrients, hence "pork and beans." They need, also, especially when dried, to be thoroughly cooked, and are best adapted to persons who do outdoor work. The flatulence which they sometimes produce, especially in persons of sedentary occupation, constitutes one objection to their use. Legumes may well be called the "meat of the poor." In Mexico the frijole (a variety of bean) is the staple food next to maize; and in the Orient the soy bean and its products, bean-cheese, etc., rank next to rice. In India lentils form the staple diet. There is a Hindu proverb that "Rice is good, but lentils are my life." The Arabs feed ground beans to their horses when extraordinary exertion is needed of them. Finely ground peas, beans and lentils form the basis of many soup-tablets and of condensed foods used by armies, explorers, etc. The pea-sausage of the German army was composed of lentil flour, bacon and seasonings. Government reports show that the Southern negro, though having salt pork, wheat flour, cornmeal, molasses and milk, needs also vegetable food to keep him in a proper condition of health. See FOOD; NUTRITION OF MAN.

VEGETARIANISM, the theory and practice of living on vegetables and abstaining entirely from flesh food, or from all food obtained by the killing of animals. The abstinence from flesh food is the essential element in the connotation of the word vegetarianism; but vege-

tarians are usually also total abstainers from alcoholic liquors, and in regard to the use of such animal products as eggs, milk, butter and cheese, and of cereals, as well as on the advisability of cooking food, different views are held among them. The average vegetarian admits into his diet the animal products above mentioned, and there are semi-vegetarians who also eat fish. The arguments for and against a vegetarian diet fall into three main classes, physiolgical and hygienic, ethical, economic.

Vegetarians claim that man is closely akin to an exclusively frugivorous group, the apes, and widely different from carnivora, herbivora and omnivora. They assert, what is universally admitted, that the actual state of mankind and the science of physiology both show that a complete fleshless diet is possible and readily procurable, and they argue that if such be the case any moral arguments that may be advanced against the eating of flesh ought to have decisive weight. Anti-vegetarians object, that with a purely vegetable diet an enormous amount must be consumed in order to obtain sufficient nutriment, and that the waste products are excessive in quantity; but it is to be noticed that whatever be the force of this argument against extreme vegetarians, it can hardly be maintained against those who admit eggs, milk, etc. Vegetarians maintain that flesh-eating is responsible for the propagation of some of the most serious diseases, notably tuberculosis and cancer, and they contend that it hinders the development of the higher nature of man both by its physiological influence and by the necessity of systematic slaughter entailed by it. It has been objected, that if animals now regularly slaughtered were allowed to breed unchecked the country would be overrun by them, but the possible answers to this argument are obvious. It is also claimed by vegetarianism that it is in such products as nuts, seeds, roots, eggs and milk, and not in the comparatively degenerate form of flesh, that nature provides the means of supporting life in its best and most nutritive form.

In a work on the subject M. Gautier says: "The vegetarian diet is not suited to European organs. But relieved by the addition of milk, grain, butter, cheese, eggs, etc., it offers many advantages. It alkalizes the blood, it regulates the circulation, and preserves the elasticity of the arteries; . . . it makes one less liable to danger from maladies of the skin and of the joints, and to congestions of the internal organs. It tends to soften the disposition,—to make us more calm and less agitated, aggressive and violent. It is practical and rational. It ought to be accepted, if one follows an ideal for the establishment of an education for races of men who are to be sweet-tempered, intelligent, artistic, peace-loving, yet nevertheless prolific, vigorous and active."

Vegetarianism is as old as the ancient religion of Hindustan, and was taught by Plato, Plutarch and other writers of classical antiquity. One of the oldest pioneers of the movement in Great Britain was George Cheyne (1671–1743), a Scottish doctor, who supported it in an 'Essay on Regimen,' published in 1740. Shelley's vindication of natural diet is well known. J. F. Newton's 'Return to Nature, or Defense of Vegetable Regimen,' was published in 1811, and in 1847 the Vegetarian Society was founded at Manchester. Eduard Baltzer (1814–87), a German liberal clergyman, introduced the movement into Germany, and founded at Nordhausen in 1868 a "Vèrein von Freunden der Natürlichen Lebensweise." His book on 'Die Natürliche Lebensweise' reached a fourth edition. Other leading German pioneers of vegetarianism are Gustave von Struve (1805–70), author of 'Die Pflanzenkost, die Grundlage einer neuen Weltanschauung' (1869), in which he associates vegetarianism with socialism; and Theodore Hahn, author of 'Die Naturgemässe Diät' (1859) and 'Der Vegetarianismus' (1869). Vegetarianism has obtained less hold in France than in Great Britain and Germany. Among the chief French works on it are the 'Thalysie, ou la nouvelle Existence' (1821) of Jean Antoine Gleizès (1773–1843) and 'Le Végétarisme rationnel scientifique' (1889) of Dr. E. Bonnejoy. The early leaders of vegetarianism in America were Amos Bronson Alcott (q.v.); Sylvester Graham (1794–1851), author of 'The Science of Human Life' (1839), and Charles Lane, author of 'A Brief Practical Essay on Vegetable Diet' (1847). The Vegetarian Federal Union was founded in 1889, and several societies throughout the world are affiliated with it. Vegetarian restaurants are comparatively common. Consult Kingsford, 'The Perfect Way in Diet' (1881); Williams, 'The Ethics of Diet' (1883), a sort of encyclopædia of the subject; Smith, 'Fruits and Farinacea the Proper Food for Man' (abridged ed. by F. W. Newman); Newman, 'Essays on Diet' (1883); Salt, 'A Plea for Vegetarianism' (1886); Richardson, 'Food for Man' (1891); Hills, 'Essay on Vegetarianism' (1893), and Oldfield, 'Tuberculosis: Flesh-eating a Cause of Consumption.'

VEHICLE SPRINGS, contrivances for diminishing the concussion between the body or the frame and wheels of automobiles, carriages and other vehicles. The most usual form of vehicle spring is built up of finely tempered pieces of steel so formed and fastened that they strengthen each other, while allowing free play for the natural spring of each leaf, and in this manner absorb most of the vibration and jolting caused by the wheels striking obstruction or inequalities in the road. See SPRINGS.

VEHMGERICHTE, fām'gĕ-rĭH"tĕ (Ger., "tribunals of punishment"), or **VEHMIC COURTS,** German mediæval courts of justice. They originated in Westphalia. They were composed of free judges (*Wissende,* "initiated"), bound to secrecy, presided over by a *Freigraf* (free count), and convened in both open and secret tribunals, the latter being for more serious offenses. The emperor and the archbishop of Cologne (lord of Westphalia) were at least nominal members. Originally, in a period of confusion, when the petty baronial courts rendered inadequate justice, the Vehmgerichte attempted to judge fairly and impartially, and to enforce recognition of law. They came, however, to employ their extensive authority in an arbitrary manner, and to use great cruelty in punishment. Maximilian I greatly abridged their power by a new code, promulgated in 1495. In Westphalia they held secret meetings until finally abolished in 1811. Consult Lindner, 'Die

Veme' (1888); Thudicum, 'Fehmgericht und Inquisition' (1889); Lindner, 'Der angebliche Ursprung der Vehmgerichte aus der Inquisition' (1890); Wiegand, 'Das Femgericht Westfalens' (2d ed., 1893).

VEII, vē'yī, Italy, an ancient Etrurian city, on the river Cremera, its site generally supposed to be marked by the ruins found near the modern village of Isola Farnese, 12 miles northwest of Rome. Veii was celebrated in the early history of Rome, with which it had several wars. The last war was between 405 and 396 B.C., when the city was taken by Camillus and laid waste. Cæsar, and afterward Augustus, established a Roman colony at Veii; but it had again become of little importance in Hadrian's reign.

VEIN, *in geology,* a mass of rock or mineral which fills fissures or cracks in other rocks. Veins are usually divided into veins of igneous rocks, of sedimentary rocks and of minerals deposited through the agency of water or gas. Veins are irregular and generally limited in extent. The history of mining affords many examples of promising veins of rich ore which gave out after being followed for a few feet or yards. The most important group of veins is that containing minerals, metallic or nonmetallic. See MINING; ORE DEPOSITS.

VEINS. See ANATOMY; CIRCULATION; PHYSIOLOGY.

VEIT, fit, Philipp, German painter: b. Berlin, 1793; d. Mayence, 18 Dec. 1877. He was grandson of Moses Mendelssohn and stepson of Friedrich Schlegel, and after studying art in Dresden he went to Rome, where he became a member of the circle of the Nazarenes (q.v.)—German Pre-Raphaelites of a religious, romantic and mediæval tendency in art, of which Cornelius (q.v.) and Oeverbeck (q.v.) were the chief representatives. There he produced the 'Seven Years of Plenty,' the 'Triumph of Religion,' the frescoes illustrating the 'Divine Comedy' in the Villa Massini; and the altarpiece 'Queen of Heaven' in the Trinità de' Monti. From 1830–43 he was director of the Städel Institut at Frankfort. Some of his large frescoes in churches won him great reputation. He published 'Zehn Vorträge über Kunst' (1891).

VELA, vā'lä, **Vincenzo,** Italian sculptor: b. Ligornetto, Tessin, 1822; d. there, 3 Oct. 1891. He was stonemason's apprentice at the building of the bridge of Viggio, and after studying under the sculptor Cacciatori in Milan went to Rome (1870) and began the model for a statue of Spartacus, now in a private collection at Petrograd. He later on took up his residence at Turin where he executed a series of works comprising a wide range of ideal and monumental subjects. His principal works are 'Hope and Resignation,' a statue for the tomb of the Donizetti family in Bergamo; a statue of 'Grief' for the tomb of the Ciani family in Lugano; 'William Tell,' a fountain statue for the same place; a standing figure of A. Rosmini in Stresa; the kneeling figures of the queen of Sardinia, Maria Theresa (1855) and that of Maria Adelaide in Turin (1861); the statue of the Minister Balbi; the 'Dying Napoleon'; 'Columbus and America,' etc.

VELASCO, Tex., town in Brazoria County, on the Brazos River, and on the Velasco Terminal Railroad, about five miles from the mouth of the river and 35 miles southwest of Galveston. It was laid out in 1891. It had its origin in the needs of the workers who were engaged in securing deep water, by jetty-work, on that part of the coast, and finally this locality was selected as the shipping-point. The work was done by a private corporation and over $1,500,000 were expended. Large vessels load and unload at the Velasco wharves. The chief industrial establishments are an ice factory, a planing mill and a machine shop. It has a grain elevator, coal and brick yards. There are extensive shipments of cotton and cotton products, grain, fruit and coal. Pop. 2,000.

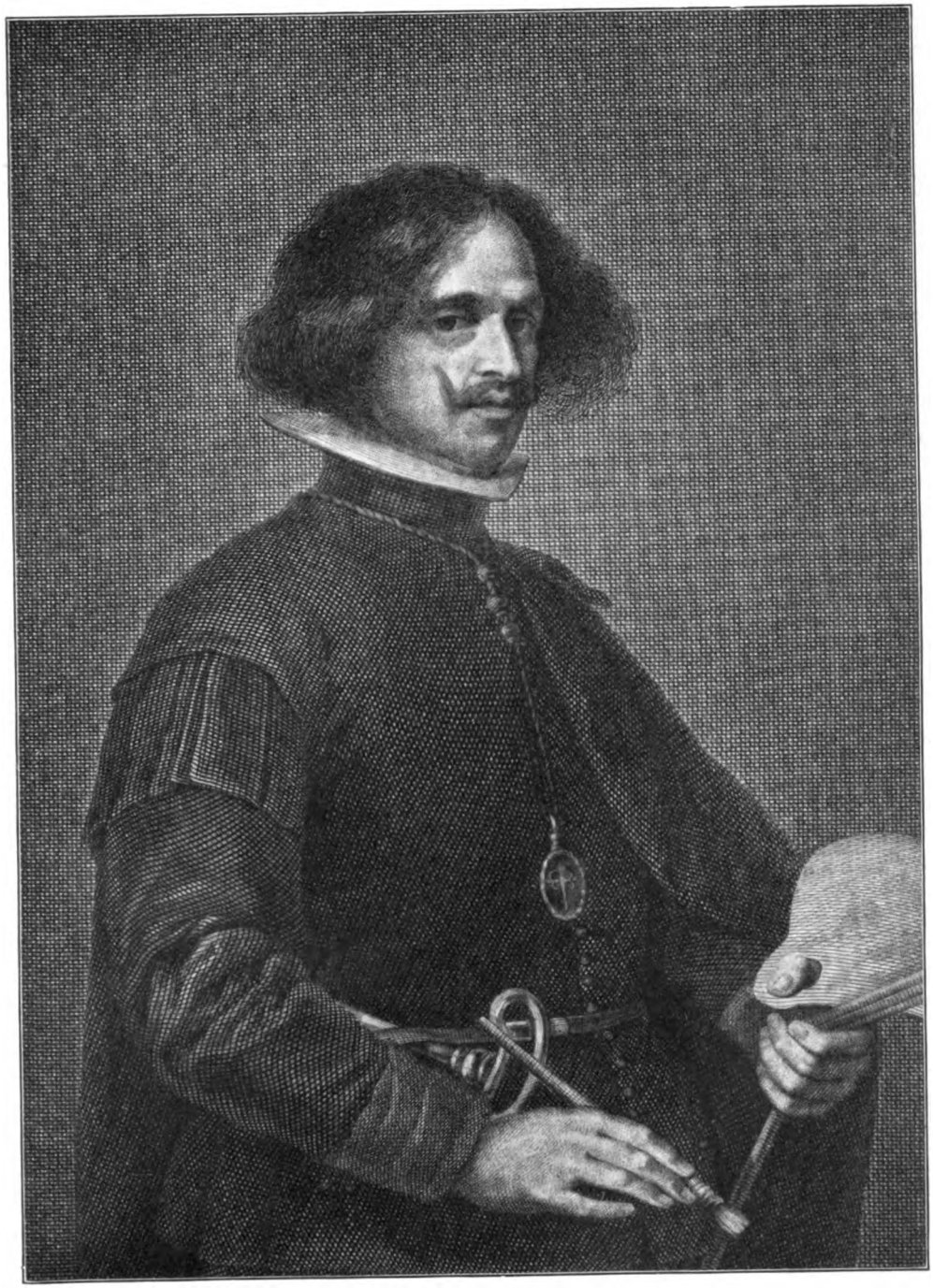
VELASQUEZ, vā-läs'käth, **Diego de,** Spanish soldier, conqueror of Cuba: b. Cuéllar, Segovi, 1465 (or 1458); d. Havana, 1522 (or 1523). After having fought in the conquest of Granada, he went to Española with Columbus in 1493, and was there prominent in warfare with the Indians. He was appointed by Diego Columbus in 1511 to effect the conquest of Cuba. With a force of 300 he landed in Cuba toward the close of the year, and encountered little resistance except from the cacique Hatuey, who was captured and killed. He assumed independence of Diego Columbus, and directed the active campaigning through his subordinate, Panfilo de Narvaez, who had arrived with reinforcements. The island was easily conquered and the natives enslaved. Velasquez made Santiago de Cuba his capital, and founded Trinidad, Matanzas and other settlements. He was connected in 1517 with the expedition of Cordova, which, seeking slaves in the Bahamas, accidentally discovered Yucatan. He also fitted out the expedition of Cortes (q.v.) for the conquest of the Aztecs, and when Cortes asserted independence sent Narvaez to take him prisoner (1520). Cortes defeated Narvaez, and Velasquez obtained no benefit from the conquest of Mexico.

VELÁZQUEZ, Diego Rodríguez de Silva y, Spanish painter: b. Seville, 5 June 1599; d. Madrid, August 1660. He came of noble family, his father being Juan Rodriguez de Silva and his mother, Gerónima Velázquez, both classified in the rank of hidalgos. At the age of 13 he began the study of painting, first under Herrera and afterward under Pacheco. From the latter he thoroughly learned the principles of drawing and of proper technique. From his earliest youth he seems to have had the settled conviction that he must paint only what he could see and sensuously appreciate. He had plenty of imagination but he always kept it subject to this sense of realism. He, therefore, appeared to have possessed much less imagination than he really did. He tried historical, religious and mythological subjects, portraits and landscapes, in fact every kind of painting that he could subject to his all-impelling sense of the necessity of realism. He probably had this realistic tendency of his nature accentuated in early youth through the teaching of his first instructor in art, Herrera, a very vigorous and capable painter, who had no love for the Italian influence on art so strongly in evidence in Spain in his day. His second teacher, Pacheco, who seems to have been paid to give his best atten-

tion to his talented pupil, thoroughly grounded him in the principles of his art, subject, proportion, perspective, coloring and technique, illustrating his lessons practically by visits to the best pictures in the city. The boy lived and moved in an atmosphere of art. Pacheco, the author of a critical work on painting, was a good and sure critic of art and had a masterly way of presenting, in concrete manner, the lessons he wished to inculcate; and thus he taught his pupil to feel what he himself recognized to be the true principles of art, and to carry out these principles, which he was not able to do himself with any notable success. Pacheco seems to have recognized the fact that his pupil had greater talent than he himself, and he appreciated at its full value the faculty he displayed for the minute study of detail. Nothing was too small or insignificant for him to examine most carefully in all its bearings. These traits characterize all the work of Velázquez from his early boyhood to mature manhood. Under Pacheco's tuition he studied every possible effect of light and shade and tried to convey them with brush directly to the canvas. These light and shade studies he applied to buildings, inns, peasant's huts, the human face and form, and to everything, in short, that might give him a more effective grasp of the subject. He carried his realism further, in an age when Spanish painters were little given to realism, and secured human models for study of the human body at rest and in action, in light and shade, and under varying conditions of both; and more especially for the changing expressions of the human face. He thus became, in early manhood, a master of the depicting of feeling, expression, passion and character; and all his life he remained a student of every phase of nature, from the most flamboyant to the minutest and most secret. His interest was, therefore, in the life around him; and he did not require to reach out beyond it in order to complete his sense of the unity of art. His work is, for this reason, the most national of all the greater Spanish artists. Pacheco, who saw the coming greatness of his talented pupil, rewarded it in anticipation, by bestowing upon him the hand of his daughter, and he seems to have been inordinately proud of his son-in-law.

Already accounted an excellent artist in Seville, Velázquez set out for Madrid with letters of introduction to people in authority. There he studied in the art galleries and painted some good portraits. But the inducement to remain in the capital not seeming great enough, he returned to Seville. Very shortly afterward, however, he was invited to return to Madrid by no less a personage than the Minister of the Crown, Olivarez, who sent him money to pay his own and Pacheco's expenses for a second trip to the capital. Both artists were so well thought of there that Olivares induced Velázquez to send for his family, at the expense of the Crown, and to make his home in Madrid, where the young painter became the close friend of the art-loving Spanish sovereign, Philip IV, who conceived a great affection for him and considered him the greatest of all portrait painters. This friendship lasted for more than a third of a century, through which long period it was never once in danger of being broken or disturbed. In 1628 an event happened which made Velázquez desirous of seeing the great art centres of Europe, especially those of Italy. This event was the visit to Madrid of Rubens, the great Flemish artist, then in the height of his fame, and still vigorous, enthusiastic and endowed with strong force of character and the power of impressing others with the firm belief in the correctness of his own methods and the worth of his own achievements. He came to Madrid commissioned to paint certain pictures for the court. Velázquez was appointed by the Crown to be his guide, mentor and friend among all the art and art circles of the capital. In this connection he won the warm regard of Rubens who was not slow to recognize his great talent and his profound knowledge of art. The following year (1629) Velázquez was enabled to visit Italy through the generosity of the king and Olivares. There he studied the great masters industriously in Venice and Rome and made copies of several notable pictures for the king. At the same time, under the inspiration of his surroundings he created much original work, some of it of notable strength and beauty. Among his copies were 'The Last Supper' and 'The Crucifixion' by Tintoretto, and works by Raphael and Michelangelo. Perhaps the most notable of his original work painted at this time is 'The Forge of Vulcan' (Madrid Gallery), a picture which reminds one of his famous earlier picture, 'Los Borrachos,' commonly known outside Spain as 'Bacchus.' But in this latter picture, while his art is no surer and his conception no truer, yet both are more pleasing; and on the whole, the latter picture is the more truly worthy of Velázquez. Both are quite Spanish in character, conception, coloring and execution. Velázquez went again to Italy in 1631; this latter time visiting Naples in company with another famous Spanish artist, Ribera; and while there, among a considerable amount of work, he painted the portrait of the Infanta María, a sister of King Philip, who also had a great admiration for her notable countryman.

Velázquez accompanied the king on many expeditions and the latter seems to have been very fond of his company. It is known that he went with him to Aragón on two separate occasions and that he there painted several pictures of the sovereign and members of his family (1642 and 1644). Naturally he was "promoted" from time to time. He had begun as gentleman usher with a daily and additional yearly allowance from the Crown. By 1648 he was in receipt of a yearly pension of 700 ducats as court painter and an additional allowance as inspector of the art in the palace. The following year he went to Italy, commissioned by the Spanish king to purchase works of art, especially statuary, with which to decorate an Academy of Art in Spain which Philip intended to found. He fulfilled his mission well and painted several Italian notables at the same time. His journey included Genoa, Milan, Venice, Módena and Rome. In the latter city Pope Innocent presented him with a medal and a golden chain and showed him other marked favors, sitting to him for his portrait. Into this latter work Velázquez threw his whole energy, with the result that it remains to-day one of his greatest pictures. By some artists it has been classed as the best executed portrait in the



D. DIEGO VELAZQUEZ

Doria Palace, Rome, where it now is. Velázquez painted several other pictures of this notable prelate. In Rome he was elected a member of the famous Academy of Saint Luke. From Rome he went to Naples and from there back to Spain, carrying with him a most notable collection of pictures and fine statuary, the latter alone numbering over 300 pieces. About 1645 Velázquez was appointed "Aposentador Mayor," a sort of general court inspector, then looked upon as a high office, the reception of which betokened for the recipient the special favor of the Spanish sovereign since the position was one of great trust and considerable responsibility. In 1659 the king bestowed upon him the Cross of Santiago (Saint James), a very high honor and notable distinction, making him a "belted knight" of Spain. The following year Velázquez was commissioned by the king to decorate the Spanish pavilion and to arrange all the ceremonies for the marriage, by proxy, of Philip's sister, the Infanta Maria Teresa to Louis XIV of France. The pavilion for the occasion was erected on the low-lying, swampy island of Pheasants, in the river Bidassoa. The extra exertion, for a man of his age, or the emanations from the swampy island, or both, brought on a fever from which he died. Velázquez had many pupils and imitators, and some of them approached his style of painting very closely. Among the best known of the former were José Leonardo, Carreño de Miranda, Juan Bautista de Maza (his son-in-law), and Pareja (his slave, whom he liberated). Himself the greatest Spanish painter, and one of the world's greatest artistic geniuses, he inspired his pupils to good work. The fact that some of them, like Leonardo and Maza, approached his own almost perfect style, is a high tribute to his talent as a teacher.

As Velázquez did not sign the greater number of his portraits it is difficult to distinguish his work at times from that of his pupils and imitators, and much of his surviving work must be recognized by the style and mannerisms of the author. The greatest of his pupils, Murillo, whom he kept in his house for three years, created a new style of painting and surpassed his master in the brilliancy of his coloring. Velázquez's work displays a very close study of nature, boldness and sureness of touch, effective management of the brush, extremely accurate drawing and good coloring, dramatic force, in short, masterly execution, great originality and power. His industry and his facility for rapid and certain work were immense. Forty portraits of King Philip are credited to him in addition to many others of various members of the royal family and notables of the court, buffoons, dwarfs and other entertainers of the sovereign and his favorites. But though his royal pension and his position at court made him essentially a portrait painter, just as Murillo's connection with the Church made him a depictor of saints and Biblical subjects, yet Velázquez produced notable historical works, the greatest of which is 'The Surrender of Breda' ('Las Lanzas'); and magnificent religious canvases, the most notable of which is 'Christ on the Cross' (Madrid Gallery). In all this work, as in his portraits, the prevailing note is that of naturalness and a consummate mastery of light and shade, combined with surpassing technique. For a detailed list of his paintings consult any work on the Spanish painters.

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JOHN HUBERT CORNYN.

VELDE, vĕl'dĕ, **Adrian.** See VAN DE VELDE.

VELDE, Willem. See VAN DE VELDE.

VELEZ, vā'lĕs, Colombia, a city dating from 1539, the second founded in New Granada, in the department of Santander, 100 miles north of Bogotà. It lies on the eastern slope of a spur of the Cordillera Oriental and is reached by a branch road from Maniquira on the main highway from Bogotà to Socorro. In its early years it was frequently used as a city of refuge owing to its difficulty of access. The production of fruits of different kinds, and the manufacture of preserves and candies, are the chief industries. Pop. (1918 est.) 9,500.

VELEZ-MALAGA, vĕ'lĕth mā'lā-gā, Spain, a city in the province of Malaga, 15 miles east of the city of that name, on the Velez, one and one-half miles from the Mediterranean. It is a well-built and prosperous town, with a good harbor, but no railway communication. It has suffered seriously from earthquake and flood. It is overlooked by a Moorish castle on a high rock, formerly called the "Key of Andalusia." The district is exceedingly fertile, and produces sugar cane, indigo, batatas or sweet potatoes, palms, olives, oranges and other fruits. Pop. (1918 est.) 24,000.

VELIGER. See LARVA; MOLLUSCA.

VELLORE, vĕl-lōr', India, a town and fort in North Arcot, Madras, 80 miles southwest of Madras city. A large pagoda, with some remarkable sculptures, is the only notable edifice. The fort is of considerable extent, but is completely commanded by the adjoining hills. Within are a great pagoda, now used as an arsenal; the hospital, the barracks, magazine and quarters for staff-officers. An American mission and college are established there. In a revolt of the native troops here on 10 July 1806, over 100 Europeans were massacred. Pop. about 45,000.

VELLUM. A medium, prepared from the skin of calves, for writing, painting, book-

binding and other purposes. A very prevalent misconception of the public is that parchment (see PARCHMENT) and vellum are one and the same. As a matter of fact the finer kinds of parchment are often termed vellum in commerce. Parchment, however, is produced from the skins of sheep, goats, etc., while true vellum is made solely from the skins of young calves. The difference between vellum and parchment consists not only in the delicate nature of the skin but in its polish, shining whiteness, its fineness generally and in its semi-transparent beauty not discoverable in parchment. While the skin of the calf is required to produce vellum, it is necessary that the animal be not over six weeks old, otherwise the skin is too stout for vellum and is destined for the tanner. The younger the calf the finer the vellum; the most beautiful and sought for is that made from the still-born calf. The process of making vellum is more costly than that for parchment. Vellum and parchment were the mediums upon which writing was done when papyrus fell into disuse to be displaced by these more substantial materials. The art of preparing vellum was perfected by the monks during the 10th and 11th centuries. As a rule the vellum of manuscripts and deeds is white and very fine until the end of the 11th century, but some manuscripts dating from the 11th and 12th centuries present a somewhat dirty appearance and have writing rather yellowish, while other specimens are on beautiful vellum and the writing is intensely black. Of course the condition of whiteness of old documents depends somewhat on the care taken in preserving them. The vellum of which fine manuscripts were made in the 14th century was called "pergamenum abortivum," referring undoubtedly to the superfine vellum produced from the skins of still-born calves. The most luxuriously worked manuscripts were done on purple-stained vellum, which was termed "pecorella." Silver lettering was done on this (*codex-purpuro-argentum*). Numerous manuscript works of ancient date are extant done on purple, called "imperial stained." A "grape-purple" vellum was preferred for writing in silver (*arguriography*), crimson vellum for gold text (*chrysography*), "cooled" purple for vermilion ink (*rubrica*). It has been claimed that purple vellum was an invention of the 13th century, but the archbishop of York, Saint Wilfrid, in the 7th century, donated to his church a book of the Evangels in purple vellum written in gold letters and bound in a cover of leaves of gold and precious stones, which he himself had written and ornamented. In the case of many vellum manuscripts only part of the page is stained, as the color was very costly to work. In miniature painting the surface of vellum is rubbed over with pumice stone to do away with inequalities in the grain; this avoids any defects in the absorption of the pigment in using this medium. In bookbinding vellum has been utilized with very artistic effects; plain white vellum binding has been termed Dutch style, while vellum with gilt decoration has been called Italian style.

CLEMENT W. COUMBE.

VELOCIMETER (Lat. *velox* (*veloc-*), swift, and Gr. *μέτρον*, measure), in general, a name applied to a class of various devices for measuring velocity, or speed, including the speed-gauge and speed-recorder for machinery. Specifically, it is used of an electric apparatus for measuring the initial speed of projectiles. Invented by Sir Charles Wheatstone (q.v.), it was improved by Col. J. G. Benton, United States army. Several more complex forms have been invented, and a simplified one by Captain Le Boulengé, a Belgian, found extensive use. See BALLISTICS.

VELOCIPEDE, a light carriage consisting of a simple frame-work, supported on two or three wheels, and which is driven by the feet acting on cranks attached to the axle of one or two wheels. The name was first given to the contrivance of the Frenchmen Blanchard and Mazurier, introduced in 1779. It consisted of two wheels placed tandem and connected by a horizontal bar upon which the rider sat astride, propelling the machine by a motion of the legs as in walking, but pushing forcibly backward upon the ground. Considerable speed was attained for short distances. See BICYCLE.

VELOCITY. See MECHANICS.

VELOCITY OF ELECTRICITY, the rate at which electricity is propagated through a conductor. The velocity of electricity through a conducting wire is in all cases very great when compared with the velocities of moving bodies, such as the velocity of a railway train or of a projectile; but the velocity of electricity, any more than the velocity of a planet, of a railway train, or of a bullet, is not a certain number of miles per second fixed for all cases; it varies for a number of causes, and to such an extent that while Wheatstone found the velocity of static electricity through copper wire to be 288,000 miles per second, in the Atlantic cable of 1858 it was found to be 3,000 miles per second. Faraday showed that a submarine cable acts precisely as a leyden-jar, that the water serves as the outside coating, and that just as a leyden-jar takes time to become charged and to discharge, so a cable through which a sharp signal is sent from one end delivers the signal at the other end more or less prolonged; that is, the deflection of the receiving needle is gradual, reaching a maximum and then at the same rate coming back to rest. Sir William Thomson showed that the more delicate the receiving instrument, the more instantaneous is the first appearance of the current at the receiving end of the cable. He gives three reasons for the retardation of the electric current: (1) Charge and electrical accumulation in a conductor subjected in any way to the process of electrification. (2) Electromagnetic induction, or electromotive force, excited in a conductor by variations of electric currents either in adjacent conductors or in different parts of its own length. (3) Resistance to conduction through a solid. The first successful attempt to find the velocity of electricity was made by Wheatstone with the revolving mirror (his invention), which has been so successfully employed by Foucault to discover the velocity of light.

The velocity of a voltaic current when the earth forms part of the circuit has been determined by the United States Coast Survey to average 16,000 miles per second. The velocity of an electric current through any conductor depends upon the resistance of the conductor,

so that in economic practice the question of velocity becomes a problem of resistances.

In the use of electric meters for the measurement of inductances and capacities it is essential that the current employed shall have a uniform speed. This is secured by the use of a device known as a "speed regulator." Several forms of this instrument are in use, but the principle is the same in all — the introduction or elimination of resistances in the field circuit by short-circuiting. For extensive data as to resistance of metals, glasses, porcelains, etc., at various temperatures above and below zero. Consult the "Smithsonian Physical Tables."

VELOCITY OF LIGHT. See LIGHT, VELOCITY OF.

VELOXITE, a smokeless explosive powder invented by William Hope in 1903. It contains no nitro compound, sulphur, phosphorus, chlorate, in fact no dangerous ingredients. The flashing point of black powder is at 640° Fahrenheit, that of cordite and all nitro powders is only from 360 to 370°, while that of veloxite is about 12,000°. Veloxite stands the hammering of a sledge hammer on an anvil. The ingredients are stable and, therefore, the powder is stable. The setting up of chemical action is impossible in any length of time and in any variations of climatic conditions. Veloxite can be made in the morning and fired in the afternoon, not requiring, as other powders do, several weeks to manufacture. It can be made cheaply, its ingredients can be purchased in unlimited quantities by the ton and it is available for small arms as well as artillery.

VELVET, a textile made of silk and covered on one side with a close, short, fine, soft shag, the other side being a very strong close tissue. The nap or shag, called also the velveting of this stuff, is formed of loops of the threads of the warp, which the weaver works on a long wire, which has attached to it a knife. The withdrawal of the wire cuts the loops of the warp, thus forming the nap. The loom on which velvet is woven has two warp beams instead of one, as with other fabrics. This is necessary because velvet is a textile of two distinct parts, the pile and the ground cloth. A much larger length of thread is used for the pile in forming the loops afterward cut. The beam for the ground cloth is slung at the back of the loom, and as this is woven the pile is worked into it. Double-faced velvet is woven with the loops of the pile thread on both sides of the ground cloth. Uncut velvet, or "terry," is woven on wires which have no knife attached. Figured velvet is obtained by alternating cut velvet and terry, using a loom with Jacquard patterns. Velvet brocades are made with the gold and silver threads as extra weft, the figure being wrought in by hand as with embroidery. Florence and Genoa were long noted for the manufacture of velvet, but Lyons, in France, is its principal seat; Krefeld and Elberfeld are the chief seats of velvet-making in Germany. Velveteen and plush are fabrics of cotton or wool woven in much the same manner as true velvet, except that the loops which form the pile are wrought as weft instead of warp. Corduroy and "thickset" are of this class. Upholstery velveteens in patterns are worked by a peculiar loosening or bulging of the weave of the ground cloth, produced by Jacquard patterns.

VELVET GRASS. See GRASSES IN THE UNITED STATES.

VELVET PLANT. See MULLEIN.

VELVET SCOTER, a duck. See SCOTER.

VENABLE, vĕn'ą-bl, **Francis Preston,** chemist and educator: b. in Prince Edward County, Va., 17 Nov. 1856: resides in Chapel Hill, N. C. In 1879 he was graduated from the University of Virginia and later at three different times studied in Germany. From 1880 to 1900 he was professor of chemistry in the University of North Carolina and in 1900 was elected president, which position he still holds. He is a member of several chemical associations in this country and in Germany. In 1905 he was elected president of the American Chemical Association. He has published the following: 'Manual of Qualitative Analysis' (1883); 'Short History of Chemistry' (1894); 'Development of the Periodic Law' (1896); with Howe, 'Morganic Chemistry According to the Periodic Law' (1898); 'Study of the Atom' (1904).

VENABLE, William Henry, American author and educator: b. Warren County, Ohio, 29 April 1836. He began to teach at 17 and was professor of natural sciences in the Chickering Institute, Cincinnati, 1862–68, and principal and proprietor of the same 1882–86. He was professor of English literature in the Hughes High School, 1889–95, and has held a similar post in the Walnut Hill High School, Cincinnati, since the last-named year. Among his numerous works are 'A History of the United States' (1872); 'June on the Miami and Other Poems' (1872); 'The Teacher's Dream' (1881); 'Beginnings of Literary Culture in the Ohio Valley' (1891); 'Let Him First be a Man' (1894); 'Dream of Empire, or the House of Blennerhassett' (1901).

VENATION (Lat. *vena,* vein), *in botany,* the arrangement of the bundles of fibro-vascular tissue (commonly called "veins") in leaves. These bundles are parts of a framework for the support of the cellular tissue. They are of importance in determining the general characteristics of the leaf, and are employed as a basis for classification. Botanists recognize two leading kinds of venation, parallel and netted (reticular). See LEAVES.

VENDACE, also **VENDIS,** a white fish (*Coregonus vandesius*), a variety of the Coregonus (q.v.), of restricted distribution, being found in only the lakes and rivers of Sweden, the Castle Loch, Lochmaben, Dumfriesshire, Scotland, and two or three English lakes. It attains an average length of from six to eight inches. It is considered a delicacy and is taken with the sweep-net.

VENDÉE, vŏn-dā, France, a western maritime department formed from ancient Poitou, and deriving its name from the river Vendée. It is bounded on the north by the departments of the Loire-Inférieure and Maine-et-Loire; on the east by the department of Deux-Sèvres; on the south by that of Charente-Inférieure; and on the southwest and west by the Bay of Biscay; area, 2,692 square miles. The surface is much diversified and is divided into three dis-

tinct parts; the *Bocage* (Thicket), on the north and northeast, a hilly and wooded district forming about one-half of the department; the *Plaine*, a tongue of land included between the Bocage and the southern limit of the department, a bare arid tract sloping down toward the sea; and the *Marais*, including all the south and west coasts, where salt marshes prevail. In the north the department is watered by tributaries of the Loire, especially the Sèvre-Nantaise, and in the south by the Lay (with the Yon) and tributaries of the Sèvre-Niortaise. Besides grain, which more than suffices for the home consumption, the principal crops are flax and hemp; a considerable quantity of an indifferent white wine is also produced. For administrative purposes Vendée is divided into three arrondissements — La Roche-sur-Yon, Fontenay-le-Comte and Sables d'Olonne, which are subdivided into 30 cantons and 299 communes; capital, Le Roche-sur-Yon. The inhabitants, particularly those of the Bocage, are remarkable for the simplicity of their manners and their attachment to old usages, to the nobility of the district and to the clergy. Inspirited by such leaders as La Roche-jacquelein, Cathelineau, Charette and Sofflet, and aided by the hilly and wooded nature of the ground, they carried on from 1793 to 1796 a war in the royalist cause, which endangered the existence of the republic. The first severe check they met with was at Savenay, 24 Dec. 1793, where their forces were broken up and the survivors and their families were dragged to Nantes and drowned in masses by Carrier. In the following year a fresh outbreak took place and the Vendeans were joined by the Chouans, but after some fighting they were pacified by the government granting an amnesty, freedom from military service, the free exercise of their religion and an indemnification for their losses. The landing of some thousands of émigrés at Quiberon encouraged them to resume their arms, but the rising was completely quelled by the activity of General Hoche, who treated the Vendeans, however, with great mildness. In the winter of 1799–1800, and again in 1814 and 1815, some risings took place in favor of the Bourbons, but they were quickly suppressed by prudent and vigorous measures. The population has been nearly stationary for the past 25 years, being before the war about 440,000. See CATHELINEAU, CHOUANS and LA ROCHEJACQUELEIN.

VENDÉMIAIRE, vŏn-dā-mē-ār, the first month in the French Revolution calendar, corresponding usually with 22 September to 21 October. Memorable in the history of the Revolution is the 13th Vendémiaire of the year IV (5 Oct. 1795), when the Paris Sections, worked upon by royalist reactionaries, rose in insurrection against the National Convention, but were crushed by Napoleon Bonaparte, then a young artillery officer.

VENDETTA, an Italian name for a blood feud; the practice of the nearest of kin executing vengeance on the murderer of a relative. In Corsica the vendetta is regarded as a duty incumbent on the relatives of the murdered man, and, failing to reach the real murderer, they take vengeance on his relatives. The practice exists, although to a more limited extent, in Sicily, Sardinia and Calabria, as well as among the Druses, Circassians, Arabs, etc. It is apparently identical with the «feud» which is still aroused at times in sections of the southern United States. In New Orleans, in 1890, the vendetta showed itself in strange juxtaposition to the law in the murder of the chief of police who had been instrumental in bringing to light some of the organized murders of the Mafia (q.v.).

VENDÔME, vŏn-dōm', **Louis Joseph,** DUC DE, French general: b. Paris, 4 July 1654; d. Vinaroz, Catalonia, Spain, 15 June 1712. He received, in 1702, the command of the French army in the War of the Spanish Succession. After having distinguished himself in Italy, Tyrol and Belgium, the Duke of Burgundy was placed over him, and the disagreement of the two commanders caused the defeat of the French at Oudenarde (11 July 1708). Through the influence of Madame de Maintenon Vendôme was recalled; but when the cause of Philip V in Spain began to decline the Spaniards requested Louis XIV to send them Vendôme. On 9 Dec. 1710, he defeated the Austrian general Starhemberg at Villa-Viciosa, and having reestablished Philip's throne soon after died and was buried in the Escurial. Voltaire gives considerable space to Vendôme's accomplishments in 'Le Siecle de Louis XIV.'

VENEERS AND VENEERING. Veneer is a thin sheet of ornamental wood, or occasionally other material used as a surface to give a handsome exterior finish to cabinet articles or other work, which are made with a basis of cheaper and it may be of stronger materials. Veneering is an ancient art. The British Museum contains some examples of Egyptian work which are many thousands of years old. From that time to the present this art has influenced the construction and design of household furniture. Pliny states that it came into general use in Rome in his day. In that wealthy capital tables veneered with rare woods were the choicest and costliest pieces of work. At a later day in Italy cabinets were veneered with ebony, ivory and tortoise-shell and inlaid with pearl and precious stones. In the Dutch and French work of the centuries that followed veneering took a prominent place in furniture decoration. In the England of the 18th century the masterpieces of Hepplewhite and Sheraton show the degree of perfection to which this art had then attained.

To the average man to-day the term «veneer» means to cover up cheap and shoddy work, or to make a whitewood cabinet or other piece of furniture look like a mahogany one. From this false conception has arisen the idea that all veneering is bad work. It must be admitted that bad work is done, and it is in consequence all the more difficult to convince the public that veneered work, when properly done, and shows that it is veneer, is the best and most effective work for the following reasons: (1) It is the only way to use the rare woods such as «curls» in satinwood and mahogany, «burrs» in amboyna or walnut, and cross-grained but pretty work which would only twist if used in the solid; (2) the layer of veneer tends to strengthen and preserve the wood on which it is laid; (3) veneering gives the only opportunity for flat decoration in furniture, by using the grain of the wood for designs in panels and on wide surfaces; (4) the process needs more care

and thought in the selection of wood, its preparation, application and finish than is required in ordinary solid work.

Cutting.— Veneers are cut in two grades or thicknesses, known as "saw cut" and "knife cut." The first named are the thickest, and vary in thickness from 1/32 to 1/16 of an inch. They are cut from the log with a large circular saw, and usually yield about 12 sheets to the inch. "Knife cut" veneers are much thinner, modern machines making it possible to get from 50 to 100 sheets to the inch, the very thin ones being used as picture mounts, etc. These are cut with rotary and flat knives. In saw-cutting the log is well steamed and placed between two stocks, like a leg in a lathe, and under a knife for its whole length. The log is now forced round and against the knife which drops the required thickness at each revolution. By cutting spirally the grain is accentuated and enlarged. In knife-cutting a flat knife is used somewhat like a plane. The log is fixed on a rising table and the blade works backwards and forwards, taking off a sheet horizontally, the knife being parallel with the grain. Formerly veneers were cut by hand and were usually one-eighth inch in thickness and were planed.

VENER, vā'nĕr, Sweden. See WENER.

VENEREAL DISEASES. See GONORRHŒA; SYPHILIS.

VENEZUELA (Ital., Little Venice, from the lake dwellings on Maracaibo; officially Los Estados Unidos de Venezuela, the United States of Venezuela), a republic lying in the northern part of South America and bounded on the north by the Atlantic Ocean and the Caribbean Sea, on the east by British Guiana, on the south by Brazil and Colombia and on the west by Colombia. It extends from lat. 0° 45′ N. to 12° 26′ N. and from long. 59° 35′ W. to 73° 20′ W., and has an area of approximately 393,976 square miles, divided among 20 states, a federal district and two territories.

Topography.— Nature has established in this land of varied physical characteristics five main divisions: (1) The long coast-line with its picturesque harbors; (2) the highlands of all that region south and east of the Orinoco, which may be called Venezuelan Guiana, or Guiana Highlands; (3) the great central area of plains or *Llanos,* those wide expanses, low-lying, nearly level, grassy but often treeless — with, at most, groups of palms and small trees near river banks; (4) the northeastern branch of the Andes Mountains; (5) the comparatively small regions of the Lake Maracaibo Basin, etc. The coast-line and the Orinoco alone would be sufficient to give Venezuela importance in the world. Concerning the vast, more or less unexplored tract lying on the right bank of the Orinoco and near the headwaters of that river, Mr. Dalton has written that "the area is primarily one huge elevated plateau about 1,000 feet or more above the sea, and from this rise a few principal mountain ranges, with some peaks over 8,000 feet high. The highest ground is found on the Brazilian frontier beginning at Mount Roraima (8,500 feet), where the three boundaries of Venezuela, British Guiana and Brazil meet, and extends thence westward and southward to the headwaters of the Orinoco. The whole area (about 294,600 square miles) is well watered," and nearly all is covered with forests "containing rubber, tonka-beans, brazil-nuts, copaiba, and all the varied natural produce of the South American tropics." The Llanos of the Orinoco have a total area of 108,300 square miles. The elevation of the Llanos ranges up to 650 feet, and more than this in the mesas of the central region, but large tracts are less than 300 feet above sea-level. The whole area is traversed by numerous streams and rivers. The fourth great tract, the northeast spur of the Andes, is all divided naturally into three parts — the Caribbean range, along the shores of the sea of the same name, the Segovia Highlands, linking the former to the higher mountains of western Venezuela, and the Cordillera of Mérida, or the Venezuelan Andes. The total area occupied by those mountain and hill-tracts is about 41,800 square miles. The fifth division includes, besides the alluvial area of the lake of Maracaibo, the Coro and Paraguana lowlands and the numerous islands in the Caribbean which belong to Venezuela, and the area is estimated as about 27,800 square miles.

From Roraima the Orinoco-Cuyuni watershed extends northward within Venezuela to the Sierra Piacoa, and thence southeast along the Sierra Imataca to the British limits again. The Sierra Maigualida forms the watershed between the Caura and the Ventuari. This southern and southeastern region is well watered by the upper Orinoco and Ventuari, with the other great tributaries, the Cuchivero, Caura, Aro, Caroni and their affluents. And yet, large as these rivers are, they are so broken by rapids that travel along them is possible only in small portable boats or rafts.

It is necessary to differentiate carefully the river system of the Llanos region, where, north of the Meta, in addition to many smaller streams which broaden out into marshy lakes or *cienagas,* we find the navigable rivers Arauca (the main waterway to eastern Colombia) and Apure, flowing from the Andes to the Orinoco in an easterly direction. The Apure receives many tributaries on its left bank from the Venezuelan Andes, most important of which are the Portuguesa and the Guárico — the latter flowing through the state to which it gives its name, and receiving the waters of at least one stream that has its source less than 30 miles from the coast in longitude 66°. Most important among the Orinoco tributaries from the north beyond the Apure is the Manapire. The waters of the eastern Llanos are carried northward by the Unare and Aragua into the Caribbean Sea. About 11,500 square miles are comprised in the famous Delta of the Orinoco, a region of inundated forest, savannah and mangrove swamp, in which the water-courses called caños are not regarded as portions of the Orinoco itself.

Climate and Health.— The marked climatic variations are occasioned chiefly by differences in elevation, latitude and vegetation. The Guiana Highland region is, however, exceptional on account of its comparatively uniform elevation, which tends to equalization of temperatures, etc. Naturally in those parts of this region where mountain ridges rise above the general level of the plateau the temperature is lower than the average, but these constitute a small part of the whole. There is an important

difference in the meteorological conditions in the various river-valleys of the Orinoco Basin, where the "white-water"—i.e., the swiftly flowing but muddy streams, with rocky beds—are always accompanied by a clear sky overhead, and mosquitoes and crocodiles abound; on the "black-water"—the deep and slow rivers—the sky is continually clouded, but the air is free from mosquitoes. The Orinoco represents the former type, the Rio Negro the latter. The rainy season in the Guiana Highland region begins in April and lasts till November; the remaining four months are fairly dry. The region of northern Venezuela is divided climatically into three regions, the hot, temperate and cold zones. The hot zone or *Tierra caliente* ranges from sea-level to an elevation of about 1,900 feet, where the mean annual temperature varies from 74° F. to 91° F. The intermediate or temperate zone, the *Tierra templada,* lies between 1,900 and about 7,000 feet above sea-level, and within these limits the mean annual temperature may fall as low as 59° or 60° F. The *Tierra fria,* or cold zone, including the highest peak in Venezuela, 16,423 feet, has mean annual temperatures ranging from 60° to zero. The *Tierra caliente* includes the greater part of Venezuelan Guiana, the Llanos, the coastal plains, the region of the lake of Maracaibo, the lower slopes and part of the central valleys of the mountains, and the Caribbean islands belonging to Venezuela. On the Llanos the hottest regions are the southern and western; the rainfall is heavy, and the wet season lasts from April to November. Maracaibo has the highest temperature of the cities of the coastal region; there the area around the lake is comparatively free from rain until August and September. The *Tierra templada* includes the greater part of the inhabited region of the hills. In the eastern part of the Caribbean Hills the rains last during the same months as in the Llanos, but in the Andes, particularly to the south, the seasons vary, and it is generally considered that there are two rainy seasons (light rains from April to June and heavy rains from August to November); but this applies rather to the eastern side of the watershed, the western side having an increasing similarity in seasons to the Llanos as one descends toward those plains. Only the higher portions of the Caribbean Hills are included in the *Tierra fria,* but between Tocuyo and the Colombian frontier the greater part of the area is situated above 7,000 feet. There strong winds prevail and the vegetation is sparse. The snow line being normally about 14,700 feet above sea-level, only the peaks of the highest mountains are snow-capped throughout the year.

The death rate for the whole republic is somewhat more than 25 per 1,000, and statistical tables show the largest tolls to be exacted by malaria (*paludismo*), typhoid fever, tuberculosis and gastric or nervous diseases. The Delta region is, of course, unhealthful. Statistics show that the Llanos division is by far the healthiest, with the Andes next, and then the Caribbean Hills; and it is true that, although in some of the coast towns situated near swampy ground the death rate is high, the northern coast as a whole presents conditions favorable to health.

Geological History and Mineral Resources.— Mr. Dalton says that the geological changes which have played their part in the building up of the physical features of the country have left Venezuela in possession of splendid assets in respect to the minerals. The Venezuelan Guiana Highlands are not only formed of the oldest rocks in this republic but represent one of the most ancient land-surfaces in the world. "The great elevated platform from which rise the peaks and mountain chains of Venezuelan Guiana appears everywhere to be composed of similar rocks, gneisses, hornblende schists and granites, all containing evidence of great antiquity in geological time. This complex is considered to be one of the oldest members of the Archæan system. Into its crevices and joints, dykes of quartz-porphyries and felsite were forced. Later movements of the earth's crust produced a shallow sea or series of lakes over this same region, and in these waters a series of beds of red and white sandstones, coarse conglomerate and red shale were laid down to a thickness of 2,000 feet. Then the area was again elevated into dry land and again veins or dykes of basalt, dolerite and similar rocks in a molten condition forced themselves into the fractures of gneisses and sandstone alike. The vertical-sided, flat-topped mountains of Guiana appear to be the result of protection that caps of igneous rock afforded to the softer sandstones immediately below. Such portions of the softer material as were thus protected from the effects of atmospheric weathering remain still as upstanding masses of horizontally stratified material, while surrounding unprotected masses have been denuded from the ancient foundation of gneiss. The geological history of the northern part of the country has been eventful in comparatively recent times; for, although no volcanoes, active or recently extinct, are known in Venezuela, the country has repeatedly sustained earthquake shocks. The first important tremor noticed after the discovery of the shores of the Caribbean was that of 1530, which destroyed the fortress of Cumaná. Earthquake and hurricane visited New Cadiz in 1543 and so disastrous were the results that from that day to the present Cubagua has been a desert island. In the 19th century there were three earthquakes of great severity. In March 1812 a shock destroyed great parts of Carácas, La Guaira, Barquisimeto, Mérida and other towns, and in the capital alone 10,000 people were killed. The other two occurred on 13 Aug. 1868 and in 1894.

With justice this part of the world has long held the reputation of being rich in minerals. Placer workings are the chief source of gold in the Guasipati goldfields in Venezuelan Guiana, but the reefs from which it is derived have been discovered and worked at odd times; and in British Guiana, where the conditions are similar, the gold is generally found along the later intrusive dykes, the smallest dykes being the richest, while most gold is found where a basalt intrusion crosses one of the older ones. Coal of fairly good quality occurs in more than one of the Cretaceous and Tertiary groups of strata, near Barcelona, Tocuvo, Coro and Maracaibo, as well as in the Andes. Iron is found in the gneiss south of the Orinoco Delta. Copper ores are fairly common in the northern cordillera,

COLOMBIA
AND VENEZUELA
SCALES
Statute Miles 125 = 1 Inch.
0 20 40 60 80 100 200 300
Kilometres, 201 = 1 Inch.
0 50 100 200 300 400
Rand, McNally & Co.'s New 11 x 14 Map of Colombia and Venezuela.
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80° A B 75° C D
1 2 10° 3 4 5° 5 6 0° 7
C A R I B B
GULF OF VENEZUELA
MAGDALENA
LAKE MARACAIBO
GULF OF DARIEN
PANAMA
BOLIVAR
SANTANDER
ANTIOQUIA
BOYACA
CASANARE
COLOMBIA
BOGOTA
CUNDINAMARCA
TOLIMA
HUILA
ARAUCA
PUTUMAYO
CAQUETA
CORDILLERA OCCIDENTAL
CORDILLERA CENTRAL
CORDILLERA ORIENTAL
SIERRA DE PERIJA
SIERRA NEVADA DE SANTA MARTA
LOS ANDES
PACIFIC OCEAN
GULF OF PANAMA
EQUATOR
QUITO
ECUADOR
PERU
Pt. Manzanillo
Colon
Puerto Cisneros
Morrosquillo Gulf
Cartagena
Barranquilla
Puerto Colombia
Santa Marta
Maracaibo
Valencia
Barquisimeto
Caracas
Maracay
Puerto Cabello
Maracaibo
Merida
Cucuta
Bucaramanga
Medellin
Manizales
Pereira
Cali
Popayan
Neiva
Ibague
Villavicencio
Bogota
Tunja
Sogamoso
Duitama
Florencia
Mocoa
Leticia
Iquitos
Tumaco
Buenaventura
Guapi
Quibdo
Turbo
Arboletes
Sincelejo
Monteria
Magangue
Ocana
Pamplona
Barinas
Guanare
Barcelona
Cumana
Maturin
Ciudad Bolivar
Puerto Ayacucho
Rio Negro
Rio Meta
Rio Orinoco
Rio Magdalena
Rio Cauca
Rio Putumayo
Rio Napo
Rio Caqueta
Rio Guaviare
Rio Vaupes
Rio Negro
Rio Apure
Rio Arauca
Rio Casanare
Rio Meta
Rio Ariari
Rio Guaviare
Rio Inirida
Rio Atabapo
Rio Negro
Rio Casiquiare
Rio Orinoco
Rio Caura
Rio Paragua
Rio Caroni
Rio Yuruari
Rio Aro

E A N S E A
ATLANTIC OCEAN
LESSER ANTILLES
ARUBA (Dutch)
CURAÇAO (Dutch)
Willemstad
BONAIRE I.
Los Roques
Aves (Bird) Is.
Orchilla
Cayo Grande
Blanquilla I.
Los Hermanos
Los Testigos
ST. VINCENT (Br.)
BARBADOS (Br.)
GRENADA (Br.)
TOBAGO
PORT OF SPAIN
TRINIDAD (British)
S. Fernando
Dragons Mouth
Punta Peñas
Península of Paria
Gulf of Paria
Serpents Mouth
Boca de Navios
Los Frailes
Margarita I.
Juan Griego
Asunción
Coche I.
Cubagua I.
Tortuga I.
Pen. of Araya
Gulf of Cariaco
Caribe
Carúpano
Irapa
Guiria
Cumaná
El Pilar
Carúpano
Barcelona
Guanta
Las Minas
Caracas Is.
Rio Chico
C. Codera
Centinela
Caracas
Puerto Cabello
Gulf of Triste
Valencia
Tacarigua
Maracay
Victoria
Los Tanques
La Guaira
Carenas
Sta. Lucia
Guapo
Uchire
Piritu
S. Mateo
Caicara
Aragua
Maturin
Arco
Sta. Rosa
Sta. Barbara
Onoto
Aragua
Guanipa
Aguasal
Freites
Tigre
Pedernales
Orinoco Delta
Manamo
Cadena
Tucupita
Sucupana
Macareo
Tabasta
Urucua
Barrancas
Mamo
Pao
Merecural
Cantaura
Zaraza
Pascua
Sta. Maria
Calvario
Espino
S. Diego
Soledad
Pto. S. Felix
Ciudad Bolivar
Guayanavieja
Sta. Catalina
Imataka
Guaralinos
Sa. de Imataka
Upata
Palmar
Sta. Maria
Guri
Borbon
Muitaco
La Piedra
Purguci
S. Pedro
Altagracia
Caicara
Cabruta
Orinoco
Sapoto
Sta. Cruz
Orituco
Guarape
Guarico
Chaguaramas
Barbacoas
Tinaco
Sombrero
Tinaquillo
Ortiz
S. Carlos
Pao
Cojedes
Torbyo
Bruzual
Ospino
Guanare
Baul
Portuguesa
Papelon
Guanarito
Camaguan
Guayabal
Apurito
Sta. Lucia
S. Fernando
Achaguas
Nutrias
S. Rafael
S. Vicente
Manjecal
S. Antonio
Urbana
Palmarito
Cauca
Arauca
Urichana
Trinidad
Cunaviche
Capanaparo
R. L. del Termino
Meta
Rio
Guahibos
Atures
Maipures
Pueblo Nuevo
Tara
Raya
Gelba
Matareni
Mitua
Chamuchina
S. Juan
Arrecival
Baltazar
Juan Viejo
Zapuara
Tebi
Cerros Guasacavi
Victorino
Yavita
Maroa
S. Miguel
Tiriquin
Nazareth
S. Carlos
S. Felipe
Sta. Rosa
Buena Vista
Bruno
Estevao
Cucuhy
Rio Branco
Jupuas
Tapurina
Rio
Caqueta
(Yapura)
Rio Negro
Brazil
Equator
Venezuela
Bolivar
Amazonas
Apure
Miranda
Bermudez
Lara
Falcon
Yaracuy
Carabobo
Guarico
Anzoategui
Monagas
Delta Amacuro
Territorio Yuruari
Sa. de Imataka
Guaraunos
Guayana
British
Guiana
Cuyuni R.
Mazaruni R.
Yuruan
Guacipati
Nueva Providencia
Tumeremos
El Callao
Choco
Avechica
Curaray
Paragua
Caroni R.
Sa. de Matos
Sa. de Maturin
Sa. de Guamapi
Sa. de Vadipu
Sa. de Maguireida
Sa. de Mapichi
Sa. de Caratal
Sa. de Caripe
Sa. de Imataca
Mt. Chanaro
5,478
S. José
S. Rafael
Sa. Carapo
Arecuna
Mt. Roraima
8,600
Barapang
Carakitta
S. Vicente
Parucupi
Parima Mts.
Pacaraima Mts.
Pic Fero de Lesseps
Orinoco Mts.
Sa. de Unturan
Sa. de Tapirapeco
Sa. do Curicuriary
Sa. Imeri
Orinoco R.
Ventuari R.
Cassiquiare R.
Casiquiare R.
Padamo R.
Jurubi R.
Aiacavi R.
Atabapo R.
Tuamini R.
Inirida R.
Guainia R.
Iriapana R.
Naviari R.
Ocamo R.
Siapa R.
Turuaca R.
Castanho R.
Pacimoni R.
Biriquitima R.
Mavaca R.
Mucajahy R.
Uraricaa R.
Parima R.
Uraricuera R.
Majary R.
Catrimani R.
Anauni R.
Jauaperi R.
Jatapu R.
Trombetas R.
Tapajos R.
Xingu R.
Iriri R.
Curua R.
Jamunda R.
Tocantins R.
Gurupy R.
Maracassume R.
Pindare R.
Mearim R.
Grajahu R.
Itapicuru R.
Parnahyba R.
Balsas R.
Tocantinopolis
Carolina
Pastos Bons
Riachão
Caxias
Codó
Coroatá
Caxias
Barra do Corda
Grajahu
Pedreiras
Alto Parnahyba
Alto Tocantins
Alto Itapicuru
Alto Mearim
Alto Grajahu
Alto Balsas
Alto Parnahyba
Alto Gurupy
Alto Maracassume
Alto Pindare

and the mines of Aroa in Yaracuy have been worked for years. Asphalt is found in the Pedernales district and on the shores of Lake Maracaibo; and in the state of Monagas the Bermúdez "lake" of asphalt covers 1,000 acres. Other minerals are galena, sulphur, marble, kaolin, gypsum, calcium phosphate, opal, onyx, jasper, quartz, feldspar, talc, mica, staurolite, asbestos, antimony, silver and tin.

Fauna and Flora.— Several species of the prehensile-tailed capuchin monkey are known in Venezuela, and many other kinds are found in the forests, including the black thumbless spider-monkeys and variegated spider-monkey; the banded douroucouli, little squirrel-monkeys and marmosets, etc. Bats and vampire bats are abundant. There are large specimens of the jaguar and puma, and (among other large cats) the ocelot, the jaguarondi and margay. In the Andes the "spectacled bear" is found; the raccoon tribe is represented by the kinkajou; the weasels by the tayra, the grison, etc. The Brazilian otter is found in the rivers of the Llanos. The red Brazilian and Ecuadorean brockets represent the deer; there are two species of peccary and the manati is not uncommon. We mention also the peculiar tree porcupine and the capybara, or "water-hog"; the aguti, the sloth, the great-maned ant-eater or ant-bear, the lesser ant-eater, the two-toed ant-eater and the armadillo; finally opossums called *rabipelados* and the *perrito de agua* or water-opossum. Many of the Venezuelan birds are beautiful, but few have musical notes. Characteristic are: The manikins, with their gay plumage; the beautiful orange-red cock-of-the-rocks; the umbrella-birds or fife-birds; the bell-birds which make a noise like the ringing of a bell; jacmars, puff-birds, trogons, the king humming-birds; the great wood-night-jars and the oil-birds or *guacharos*. There are flocks of green parrots and of blue and red or yellow macaws in the forests. No less than 32 species of falcons or eagles are known and on the river-courses many water-birds are found — among these the herons or *garzas*, storks and ibises, rosy white or scarlet flamingoes, curassows and guans, the hoatzins (resembling pheasants), etc. The snakes are very numerous, poisonous varieties being the coral-snake, rattle-snake and "bushmaster," and non-poisonous varieties the water-boa and anaconda, the *cazadora* and the wood-snake or *sipo*. There are 11 species of crocodiles; about six genera of frogs and toads represent the amphibians, and of the former, one emits in croaking a sound resembling a human shout so nearly that "a number of them give the impression of a crowd at a football match." Among the fish, the well-known *caribe*, ferocious as its name implies, and the electric eel, or *temblador*, certainly receive more than their proportionate and appropriate share of attention in travelers' accounts, the life in the seas, rivers and lakes being abundant and varied. Insects of the forest regions (one-half of the entire country) naturally resemble those of the Brazilian *selvas* — the gorgeous butterflies and brilliant fireflies, the monkey-spiders, etc.

Within the vast forests of southern Venezuela the plants range from the alpine shrubs and reindeer moss of some of the high plateaux and hills to the bamboos and orchids of the river banks. Forest giants and timber trees are: The mora, with dark-red, fine-grained wood; the mahogany and a tree resembling rosewood; the very large ceiba and mucurutu or cannon-ball tree. Specially important products of the forests are the Brazil nut, the tonka-bean (sarrapia), balatá, copaiba-balsam, rubber and *cinchona* or quinine. In the hot lowlands the chief products are cacao, sugar, plantains, bananas, cassava, maize and cocoanuts, with dyewoods and tanning barks, including dividivi, logwood, mangrove and indigo. In the cooler uplands (lower *Tierra templada*) coffee, cotton, cocoa, etc., flourish near the fields of wheat and potatoes; and a single garden may produce both roses and bougainvilleas; a single orchard both papayas and quinces. The higher part of the *Tierra templada* shows us both palms and pines — in brief, a greater variety of plant life than can be found in the hot lowlands.

Political Divisions and Cities.— Venezuela is divided into a federal district, 20 states and two territories. These, as far as possible with their areas, capitals and populations, are given herewith. The total area is about 393,976 square miles and the population is estimated at 2,850,000.

STATES	Area (square miles)	Population	Capital	Population
Anzoátegui	16,703	31,000	Barcelona	13,000
Apure	29,529	19,500	San Fernando de Apure	5,000
Aragua	2,161	28,000	La Victoria	14,000
Bolivar	91,868	52,217	Ciudad Bolivar	11,686
Carabobo	1,794	198,396	Valentia	49,000
Cojedes	5,712	104,262	San Carlos	.....
Falcón	9,572	139,110	Coro	9,452
Guárico	25,630	220,644	Calabozo	6,000
Lara	7,642	231,189	Barquisimeto	27,069
Mérida	4,361	108,105	Mérida	13,366
Miranda	3,068	172,874	Ocumare del Tuy	.....
Monagas	11,155	90,415	Maturin	4 358
Nueva Esparta	490	51,121	La Asunción	.....
Portugesa	5,867	114,559	Guamare	4,000
Sucre	4,554	116,142	Cumaná	12,223
Táchira	4,284	124,596	San Cristóbal	16,797
Trujillo	2,856	177,855	Trujillo	10,481
Yaracuy	2,740	102,180	San Felipe	17,959
Zamora	13,587	75,493	Barinas	6,000
Zulia	25,283	182,614	Maracaibo	34,740
Federal District	743	135,730	Caracas	90,000
TERRITORIES				
Amazonas	108,736	45,097	San Fernando de Atabapo	3,000
Delta-Amacuro	15,517	9,213	Tucupita	4,500

Government.— Venezuela is a federal union of states that retain autonomy in their internal government, certain limited powers only being vested in the federal government. The Constitution now in force is that of 13 June 1914. The legislative authority is vested in a Congress of two houses — the Senate and Chamber of Deputies — the former consisting of 40 members elected by the legislative assemblies of the states for three years, two for each state, Venezuelans by birth and over 30 years of age; the latter composed of deputies chosen from each state and the federal district by a direct vote and for three years, one deputy for each 35,000 inhabitants and an additional deputy for each additional 15,000. Deputies hold office three years, must be Venezuelans by birth and over 21 years of age. Congress meets on 19 April of each year, the sessions lasting 70 days.

The executive power is vested in a President and a cabinet of ministers, who act in conjunction with the President. The President is elected by the National Congress for seven years; and must be a Venezuelan by birth and over 30 years of age, and is eligible for the constitutional period immediately following that in which he holds office. During the temporary absence of the President, the office is occupied by the minister of state designated by him. In case there is no President, the power is exercised by the president of the Federal and Cassation Court, who must then immediately convene the Congress to elect a new President for the remaining term of the office. The cabinet is appointed and renewed by the President and is responsible to him alone. It is composed of seven ministers, in charge of the departments of Interior Relations, Foreign Relations, Finance and Public Credit, War and Marine, Fomento (Promotion), Public Works and Public Instruction. The federal judiciary comprises the Supreme Federal and Cassation Court and courts of first instance established in the states, the federal district and the territories. The justices of the Supreme Court, seven in number, are elected by the National Congress for a term of seven years and the court meets annually.

Each of the 20 states has a legislative assembly whose members are elected in conformity with the respective state constitutions. The executive power of each state consists of a president and a secretary-general. The states are divided into districts and the latter into municipalities, each district having a municipal council and each municipality a communal board. The federal territories are administered by governors appointed by the President of the republic, the governors in turn appointing their secretaries. The federal district comprises the city of Carácas, the capital of the republic, together with the parishes of El Recreo, El Valle, La Vega, Antimano, Macarao, Macuto and El Departmento Vargas.

Education and Religion.— Attendance at schools of primary grades is compulsory and free. The public schools are maintained by the nation, the state or the municipalities, according to circumstances. There are about 1,500 elementary schools with an attendance of 50,000 pupils. Of secondary schools there are 102 (58 for boys and 38 for girls, the others admitting both sexes), while Carácas has a normal school for young women and another for young men, for the practical instruction of each sex. There are 34 national schools for higher instruction and the government subsidizes 21 other schools of this grade. A degree is given at the end of a four years' course. Carácas has its famous university and Mérida the University of Los Andes, both having faculties of political and ecclesiastical sciences. The university at Carácas has faculties of medicine and mathematics, while in the capital there is also a school of engineering. Instruction in the fine arts, in arts and crafts and military and naval matters is given in special organizations. Moreover, there are commercial schools in Carácas, Ciudad Bolívar and Maracaibo, in which both day and night classes are held. The government has established at Puerto Cabello a practical school of naval construction which is maintained in connection with the docks and shipyards. In the city of San Cristóbal there has been inaugurated the Simón Bolívar School of Political Science. At Carácas a school of mathematics with courses in higher mathematics and sciences has been opened; and there has been added to the school of commerce at Carácas an institute for the study of modern languages. It is worthy of note that, in spite of the apathy of some of the states and the decreased public revenues during the European War, earnest efforts on the part of the Venezuelan government to extend the school provision and improve the entire system of education have been continued. A recent report of the Minister of Public Instruction dwelt upon the need of a new order of rural education. It was pointed out that small model farms should be attached to such schools, the distinguished official observing: "If this plan is followed throughout the republic and the small farm schools provided with competent instructors, the benefit in the development of agricultural industry, the basis of new public wealth, will be great." The National School of Arts and Trades for boys maintained at Carácas offers a select course in the general subjects of primary education, together with training for various trades. In the general course mathematics is extended to include geometry, and lineal drawing forms a special feature. The trade courses are numerous, including typewriting, lithographing, industrial modeling, bookbinding, metal work, ironwork, carpentry, tapestry, woodwork, forging, electrical engineering, telephoning, management of automobiles, etc. The Woman's School of Arts and Trades, Carácas, is also a national institution, under the control of the Minister of Public Instruction. Applicants for admission to the school as regular students must have completed the five years' course of elementary instruction as shown by a certificate of proficiency. While Roman Catholicism is the state religion, there is toleration of other forms of worship. The archbishop of Caracas has five suffragan bishops.

Army and Navy.— Under the provisions of a recent law of the National Congress, the standing army of Venezuela numbers about 9,000 men, including commissioned officers. The active army has infantry, artillery and cavalry. It contains 20 battalions of infantry, with 400 men to a battalion, and eight battalions of artillery. In addition, there are reserves estimated to number about 100,000 men. The Vene-

The Grand Salon of the Federal Building in Caracas. In the centre we see the great painting of the Signing of the Declaration of Independence of Venezuela and on the ceiling are frescoes of battles of their war for freedom

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1 A tourist train at the Three Thousand Level

2 Main Street, Caracas

zuelan navy consists of two cruisers, the *Mariscal Sucre* and *General Salom;* three gunboats, *Miranda, José Felix Ribas* and *Salias;* an army transport, the *Zamora,* the brigantine *Antonio Dias,* and another small craft, the *San Carlos.* The personnel of the navy comprises about 500 officers and men.

Agriculture and Cattle Raising.— Over 200,000 acres are devoted to coffee, on estates in the northern and western zones of the country, and the value of the exports of coffee annually is about $14,000,000 (average of the years 1913–16, inclusive). Both cacao and sugar are produced, the number of cacao plantations being about 5,000 and the annual output of sugar about 3,000 tons. Cotton is cultivated, and is almost altogether consumed in the textile mills operating in Valencia, Carácas and Cumaná. The livestock has always been a source of national wealth, and it is thought that the extensive llanos toward the south and in the drainage area of the Orinoco River will, when better utilized, be regarded as among the best grazing lands in America. Modern refrigerating plants lately established in Puerto Cabello and in Barranco on the Orinoco have given impetus to the raising of cattle for the export meat trade. Estimates of the livestock in 1915–16 were as follows: More than 2,000,000 cattle, about 1,700,000 goats, 177,000 sheep, 191,000 horses, 1,600,000 pigs, etc. The agricultural and pastoral industries employ about 60,000 laborers. A presidential decree of 12 March 1917 created an experiment station of agriculture and forestry, with a garden of acclimatization, to be located on lands near the city of Carácas. The purposes for which it was created were stated to be: The study of improved methods of cultivation of the principal agricultural products of the country; introduction, selection and distribution of seeds; experiments in reforestation; report upon soils suitable to each kind of cultivation and the crops to each region; and practical work for the training of agricultural foremen and forest rangers.

Manufacturing Industries.— As a rule, Venezuela imports all manufactured materials that are required; there are, however, several sawmills and lumber factories, using native woods, and tanning factories where leather of good quality is prepared. Two paper factories have proved commercially profitable. The mills of Valencia, Carácas and Cumaná turn out cotton cloth and many finished articles of clothing. In Cumaná there has recently been established a factory for the extraction of cocoanut oil and cocoa butter and exportation of these products has already taken place. Other products are: Matches, chocolate, beer, glass, cigarettes, etc. Increase in the manufacture of sugar was noted (1916–17) in the states of Zulia and Yaracuy.

Commerce.— Venezuela's foreign trade for the year 1915 amounted to $36,874,663, of which $13,470,236 represented imports, and $23,404,427 exports. The figures for the preceding year were: Imports, $13,987,465; exports, $21,520,534; total, $35,507,999. The decrease for the year in imports was $517,229, and the increase in exports, $1,883,893, or a net increase of $1,366,664. The latest available statistics show volume of trade (by values and countries) as follows:

COUNTY	Imports		Exports	
	1915	1916	1915	1916
United States	$8,231,400	$13,428,000	$13,647,800	$12,223,600
United Kingdom	2,847,000	4,623,400	644,800	557,400
France	678,000	1,029,000	3,086,000	4,483,600
Spain	675,000	1,199,000	1,119,200	2,085,000
Italy	500,000	400,000	500,000	480,000
Holland	814,000	250,000	2,180,000	650,000
Trinidad	164,000	174,000	1,060,000	814,000
Total including other countries	$13,958,800	$21,382,800	$24,253,200	$23,530,000

The principal articles imported during recent years (from all sources, including the United States) were: Agricultural implements and machinery, automobiles and accessories, bagging, butter, cotton, textiles, drugs and medicines, flour, lard, machinery (other than agricultural), rice, tanned or unmanufactured skins, stearin, thread and wines. The chief articles noted in 1917 as imports from the United States were cotton cloths, flour, leather and iron and steel.

The principal articles of export for 1916, with approximate values, were: Coffee, $12,989,000; cacao, $4,318,600; cattle hides, $2,025,000; balatá, $809,293; gold, $1,408,900; goat and kid skins, $310,000; asphalt, $288,000; beef cattle, $318,000; sugar, $600,000; copper ore, $300,000; rubber, $140,000; chicle, $26,000, beef, frozen, $334,000; pearls, $172,000.

In foreign trade there is a growing preference for the metric system of weights and measures, which was adopted by decree of 18 May 1912.

Money, Banking and Finance.— The monetary system is based on the gold standard, the unit being the bolívar, divided into 100 centimos, and weighing 0.32258 grammes of gold .900-fine, or say 0.29032 grammes of pure gold. The par value of the bolívar is $0.19295, currency of the United States, and the par value of $1.00 in terms of Venezuelan currency is B 5.18262.

The principal gold in circulation is Venezuelan gold of the same weight and fineness as that of the Latin Monetary Union. Probably more American gold is in circulation in Venezuela than any other foreign gold coin.

In January 1912, the government of Venezuela issued a decree fixing the value of

the foreign gold coin circulating in the country and specifying that public offices must receive and pay out these coins at the following rates:

	Bolivars
20 franc piece of France, Belgium, Italy, Switzerland (fractions in proportion)	20 00
English sovereign or £ sterling (half-sovereign in proportion)	25 25
Spanish gold onza, onza patriota, Central American onza of any year, Colombian onza, etc.	80 00
United States twenty-dollar gold piece (fractions in proportion)	104 00
German double crown or 20 mark piece (fractions in proportion)	24 75
Double condors of Colombia (fractions in proportion)	100 00
Mexican onza, weighing 33.770 grammes .875-fine gold	100 00
Spanish Isabelina of 25 pesetas (fractions in proportion)	25 00

The exchange rates as normally quoted in Venezuela are (for checks):

American Gold.....3-days' sight	B 5.22 to 5.25=$1.00
American gold.....60-days' sight	B 5.15 to 5.18=$1.00

The three principal banking institutions are: The Bank of Venezuela (capital B 12,000,000, headquarters at Carácas and agencies at 14 other points in Venezuela, issue of bank notes constantly under $400,000); Bank of Maracaibo (capital B 1,250,000); Bank of Carácas (capital B 6,000,000, branches in some of the important Venezuelan commercial centres, circulation of bank notes to the amount of about one-tenth of the issue allowed by its charter).

In April 1915 Mr. L. Elwyn Elliot wrote: "For the last four years Venezuela has been in the agreeable position of possessing a substantial surplus of national revenue over expenditure, and as a part of this ready cash has been preserved in the country's exchequer no doubt it will assist in tiding over such financial disintegration as resulted from the European War outbreak. Since the year 1910 this surplus has varied, but there has always been an addition to the national fund; in 1912 it amounted to nearly $2,500,000 gold."

The principal items of the budget for the year ended 30 June 1918 were:

Revenue		Expenditures	
Customs	$2,140,000	Interior	$1,868,005
30% of contribution	642,000	Foreign Affairs	218,909
Tax on import dues	535,000	Finance	2,905,765
Transit tax	60,000	War and Navy	1,960,564
Liquor tax	800,000	Internal development	605,454
Tobacco	1,100,000	Public works	636,280
Salt revenue	1,100,000	Public instruction	540,798
Stamps	710,000	Budget of rectification	88,223
Other revenue	625,000		
Treasury balances	1,111,600		
Total	$8,824,000	Total	$8,824,000

It remains to present the following synopsis of Venezuelan loans and statements of the public debt:

1820. Debt contracted while Ecuador and Venezuela formed part of greater Colombia. It amounted to £547,783, for which debentures were issued.

1822. Loan by Graham and Powels for £2,000,000. Issue at 80 per cent, 6 per cent interest per annum. A portion of this loan was used to cancel the debt of 1820.

1823. Loan of $30,000,000. General revenue and tobacco revenue pledged as a guaranty.

1824. Loan of £4,750,000 by B. A. Goldsmith and Company, Hamburg. Issue at 85 per cent. Interest rate of 6 per cent per annum.

1834. An apportionment was made in this year for the public debt of greater Colombia, Venezuela assuming 28.5 per cent, or £1,888,396.

1848. Conversion of active debt interest at the rate of 4 per cent per annum.

1856. Venezuela received $1,140,000 in 4.5 per cent Peruvian bonds, as portion of debt from Peru.

1862. Loan issued at London for £1,000,000, at the rate of interest of 6 per cent per annum, 2 per cent sinking fund. Rate of issue, 63 per cent. Pledge was given of 55 per cent of import duties collected at La Guaira and Puerto Cabello.

1864. General Credit and Finance Company of London took loan of £1,500,000 at 60 per cent issue and 6 per cent interest.

1872. Decree by which custom receipts were divided into 100 units, of which 27 per cent was allotted for the service of the external debt.

1889–1891. Public debt of Venezuela is divided into four classes: Domestic, diplomatic, foreign and bonds. In 1891 the total debt of Venezuela was as follows:

Domestic (5 per cent) consolidated	$7,595,227
Foreign (3 per cent) external	13,450,675
Diplomatic (13 per cent)	1,000,000
1 per cent monthly debt	647,499
	$22,693,401

Less than 14 per cent of revenues was pledged for the service of these obligations.

1895. German loan of 50,000,000 bolivars by Diskonto-Gesellschaft of Berlin, at 80 per cent issue. Bonds bearing 5 per cent interest and 1 per cent sinking fund.

1902. Consolidation of various internal debts by issue of bonds for 65,000,000 bolivars at 6 per cent.

1902. Debt of allied powers by virtue of protocols signed at Washington, totaling $7,147,386.

The annual report of the Secretary of the Treasury of Venezuela to the Congress, dated April 1915, gave the following resumé of the public debt:

Internal debt:		
I. National internal consol, 6 per cent — Bolivars: 1st issue 23,927 47; 2d issue 16,772 12	40,699 59	
II. 1 per cent bonds, eighth issue	38,165 62	
III. National internal 3 per cent consol	59,068,721 47	
IV. National internal consol, no interest	1,135,644 83	
V. Treasury bonds to bearer	349,102 13	
		60,632,333 64
External debt:		
I. National 3 per cent diplomatic (by diplomatic conventions)	9,723,291 61	
II. Provisional certificates (Spain)	1,600 00	
III. Diplomatic debt (3 per cent), conversion and issue of 1905	101,267,650 00	
		110,992,541 61
Or a total indebtedness of		171,624,375 25

This is equivalent to $33,000,000, which is a per capita debt of about $22.

Transportation and Communication.—The total length of railways in operation in Venezuela is 534 miles and the number of lines is 12 (five national and seven foreign), with an invested capital of approximately $40,000,000. There are several points along the coast from which railways extend into the interior, but only in one locality have these lines been connected. In the extreme west there are three lines approaching Lake Maracaibo, but they are independent of each other and serve quite different areas of the country. Passing along the coast there are several short lines, facilitating traffic between the interior and the sea; these, too, bear no relation to each other. The only place in the republic where an extensive

development has taken place is near the capital, Carácas, and in the most populous districts of the country. From the two most important ports on the Caribbean Sea, Puerto Cabello and La Guaira, railways pass to the interior, one to Valencia and the other to Carácas. Between these two interior points a third railway has been built, so that this rich and productive district is well supplied, comparatively, with transportation facilities.

Street railways (electric) are in operation in the capital. The government is giving special attention to the maintenance and improvement of its public roads and highways. At present two important roads are in process of construction, one 31 miles long, from Carácas to Guatire, and the other 36.6 miles long, from Maracay to Ocumare. The projected Great Western Highway, more than 700 miles long and designed to link Carácas with San Cristóbal, is the greatest public work the country has ever planned. It will give access or facilitate approach to vast areas in seven states. The waterways form important means of communication and transportation, there being no less than 70 navigable rivers in the country, with a total navigable length of over 6,000 miles, of which the Orinoco, the third largest river in South America, with its tributaries, furnishes nearly 4,000 miles. Other navigable rivers are the Meta, the Apure, the Portuguesa, the Yaracuy and the Escalante, all of which are navigated by steamships for considerable distances. The Zulia-Catatumbo River flows into Lake Maracaibo and is navigable for small steamers, while the majority of the other rivers are navigable for steam launches and flat-bottom boats only. A regular steamship service is maintained on the Orinoco, Apure and Portuguesa between Ciudad Bolívar, the principal port on the Orinoco, and the interior, as well as points along the coast. Ocean-going vessels enter Lake Maracaibo, which covers an area of 8,000 square miles, and is navigable in its entirety. Lake Maracaibo is connected with the Gulf of Venezuela and the Caribbean Sea by means of a strait 34 miles in length and from five to nine miles wide. Lake Valencia is navigated by small steamers. With its coast line of more than 2,000 miles, Venezuela possesses no less than 50 bays and 32 ports. The most important of the latter is La Guaira. Other ports at which ocean-going vessels call regularly are Puerto Cabello, Carupano, Guanta and Cumaná. Ciudad Bolívar, on the Orinoco River, 373 miles inland, and Maracaibo, on Lake Maracaibo, are the most important inland ports.

A regular service is maintained by several lines of steamers between New York, New Orleans and Venezuelan ports, and European lines to the Caribbean Sea have La Guaira as a port of call. The Fluvial and Coastwise Navigation Company of Venezuela has arranged with the government to establish a regular semi-monthly steamship service on the Orinoco River and its tributaries, extending to Port of Spain, Trinidad, as well as between Ciudad Bolivar and Maracaibo, touching at Cristóbal Colón, Port Sucre, Carúpano, Guanta, La Guaira, Puerto Cabello, La Vela, and possibly at intermediate points.

There are 309 post offices scattered throughout Venezuela, and the telephone and the telegraph are both steadily increasing in use. The number of telegraph stations is given as 211, with wire extending 5,455 miles. The telephone services have about 13,000 miles of wire.

Population.— The number of inhabitants was about 2,850,000 in 1917 — averaging rather more than seven to the square mile. As Mr. Dalton has written, the Indians have in general been absorbed into the Spanish-speaking nation. Aboriginal inhabitants who preserve their habits and racial customs unchanged are found principally or only along the northwest frontier and in the forests of the southeast and south. The Goajiros dwell as an independent tribe among the mountains along the Colombian frontier; the Caribs inhabit forests along the banks of the Caroni and the upper Orinoco and its tributaries; and in the remote southern regions of forest and highland there are about 16 tribes of other native races. The vital statistics for 1916 show 6,696 marriages, 74,816 births, 66,186 deaths, 8,596 immigrants and 7,637 emigrants.

History.— Dr. H. J. Spinden, of the American Museum of Natural History, writes in the *Scientific American,* 19 Aug. 1916, that the region now called Venezuela "is generally recognized (by archæologists) as the point of departure for the original culture of the West Indies." It is probable, also, that long before the discovery of the New World the tribes or peoples of the mainland, from the plateau of Bogotá to the valley of Mexico, held communication with tribes inhabiting the lower valleys of the Venezuelan Andes and the Caribbean Hills. Nevertheless the aborigines had advanced very little beyond mere savagery when Columbus, on 31 July 1498, coasted along the south side of the Peninsula of Paria. In 1499 Alonso de Ojeda, Amerigo Vespucci and others set sail, and, after landing several times on the peninsula just mentioned, continued the voyage westward to Coquibacoa (lake of Maracaibo), where the Indian pile-dwellings on the shores of the lake attracted special attention, recalling Venice, on a very small scale; and (perhaps by Amerigo's suggestion) the name Little Venice, or Venezuela, was bestowed upon that region. Another group of voyagers in the same year touched at Margarita Island and obtained pearls from the natives. In 1500 about 50 adventurers, sailing from Hispaniola, established a settlement on Cubagua Island, near Margarita, and naturally an uncontrolled exploitation of the pearl fisheries began. At Cumaná, Manjar and a point near Barcelona on the mainland coast, there were settlements of a different character in 1513, 1518 and 1520: Franciscan and Dominican monks, engaged in missionary work at these continental stations, laid down their lives as martyrs in a noble cause. It was after studying the situation here that Bartolomé de las Casas used all the force of his great talent for the suppression of the traffic in Indian slaves. Nueva Córdoba, the modern Cumaná, was founded in 1521; Cori in 1527. The rule of the Welser (the bankers of Augsburg to whom Charles V granted the privilege of exploiting the province of Venezuela) was endured during two miserable decades, practically ending in 1545, though the grant was not formally withdrawn until 1558. In 1561 occurred the rebellion of Lope de Aguirre. Carácas, or Santiago de Leon de Carácas, was founded in 1567 (presumably, though the exact date has not been

recorded) beside the Villa de San Francisco which Faxardo had built in 1560. In 1595 Sir Walter Raleigh first visited these regions of the "Oronoca," as he wrote the name (compare 'Archæologia,' Vol. XVI, pp. 188–192, London, Society of Antiquaries, 1812). Berrio y Oruña in 1615 led an expedition from San Thomé, east of the mouth of the Caroni, in quest of the fabled city of Manoa. In 1656 a station was again founded at Barcelona by Franciscan monks, and organized attempts to civilize the Indians were so largely successful that within 150 years the Franciscans founded 38 towns with 25,000 Indian inhabitants. Other orders established missions in 1686. The University of Carácas was founded by Philip V in 1721. The whole of what is now Venezuela (with the exception of the Maracaibo region) was in 1731 included in a new *Capitania-General,* to which Maracaibo was added in 1777.

The first definite attempt at revolt from the mother-country occurred in 1797. Its leaders were captured and executed. A Venezuelan gentleman, Don Francisco Miranda, invaded the colony at Ocumare 25 March 1806. Repulsed by Captain-General Vasconcelos, he retired to Trinidad and about five months later made an unsuccessful landing at Coro. The first Venezuelan Congress (44 deputies elected by seven provinces) met on 2 March 1811; the Declaration of Independence by the deputies took place on 5 July 1811. The seven provinces were at that time said to be regarded as forming a confederation of free, sovereign and independent states; nevertheless, when leaders of the revolution were sufficiently strong to declare a constitution on 21 Dec. 1811, power was granted by that instrument to the central government to revise the provincial constitutions. On 25 July 1812 Miranda, who had been appointed dictator by Congress, capitulated with 4,000 men to the royalist leader, Monteverde, who was in command of only 3,000; four years later he died in prison in Spain. In 1813 Simón Bolívar, Venezuélan aristocrat, then 30 years of age, became the leader of the patriots. Initial successes were his; but a rising of half-breeds of the Llanos under Boves, in behalf of the royalists, delayed the conclusion of the struggle for years. Boves with royalist forces defeated Bolívar, who retired to the Antilles; an expedition of 15,000 men was sent from Spain under Morrillo; in 1815 the defeat of the patriots seemed, from the viewpoint of their European contemporaries, absolutely assured. But Simón Bolívar had gained a purely American point of view — he planned such campaigns as should liberate all of Spanish South America; and, as a matter of fact, to his brilliant leadership must be ascribed the prompt liberation of one-half of it. On March 1818 Col. Daniel O'Leary arrived with troops raised in London, consisting largely of veterans of the Napoleonic wars — tried soldiers destined to play an all-important part in the liberation of Venezuela. Elections were arranged in the autumn, and on 15 Feb. 1819 Congress was installed in Angostura. In June Bolívar set out, accompanied by Col. James Rook and the British Legion, on his famous march to New Granada (Colombia); defeated the royalists in the battle of Boyacá on 7 August, and on 17 Dec. 1819 inaugurated the Great Colombian republic, embracing the largest part of northwestern South America. The last stage of the struggle began on 28 April 1821. Bolívar was in Tinaquillo, with 6,500 men. His generals were: Paez, in command of the British unit, and the Bravos de Apure; Cedeño, with one brigade of La Guardia, and the Tiradores, Boyaca and Vargas battalions; Playa, with a regiment of English rifles, the other brigade of La Guardia, the Granaderos and Vencedores de Boyacá; and Anzoátegui, with one cavalry regiment under a Llanero leader. The decisive battle of Carabobo, a victory for the patriots, was fought on 24 June 1821 by that force of 6,500, the opposing royalists numbering 5,000 men. The latter occupied a position difficult to reach, and their defeat in such circumstances proved to be such a crushing blow that, although casual fighting continued for awhile, the end was in sight. On 8 Oct. 1823 the last of the royalist adherents capitulated.

Finding her position in the Great Colombian Union unsatisfactory, Venezuela withdrew from it on 13 Jan. 1830. Bolivar, to whom the Congress had given dictatorial power in 1828, retired from office on 1 March 1830 and died of phthisis on 17 Dec. 1830 at Santa Marta. In April 1831 the new Congress of Venezuela assembled and elected General Paez as President of an independent republic of Venezuela; an embassy was sent to Bogotá and Carácas became once more the capital on 25 May. On 24 March 1854, President José Gregorio Monagas promulgated a decree abolishing slavery in Venezuela. Public works "of some magnitude" and a £1,500,000 European loan were authorized in 1863; the new federal Constitution was adopted 28 March 1864. Guzman Blanco, provisional President in 1879, was formally elected in 1880; and it has been said truly that he was "either actually or virtually President" throughout the period from 1880 to 1892. Ex-President Crespo secured re-election as Guzman Blanco's successor; and it was during his administration that the arrest by the Venezuelan authorities of two inspectors of the British Guiana police on the Cuyuni River brought to a crisis the long-standing dispute in regard to the boundary between the British and the Venezuelan possessions.

We should bear in mind here the fact that during many years protests had been made by the representatives of Venezuela against the encroachments of residents and officials from British Guiana. The contentions of the two parties were: On the part of Venezuela, that the Dutch, to whom the British were successors, had only claimed jurisdiction on the east side of the Essequibo River; on the part of Great Britain, that the Dutch had in 1759 and in 1769 put forward the claim that their territory included, not merely the Essequibo River, but the whole of the basin drained by that river and its tributaries. The British government refused to consent to arbitration of the boundary, failing agreement by Venezuela that such parts of the Essequibo Valley as had been effectively occupied by British colonists should be recognized as British territory. Then came the arrest mentioned above.

Crespo appealed to Washington for protection. President Cleveland took up the cause of Venezuela, and in December 1895 sent his famous messages to Congress, in which he declared that any forcible action by Great Britain

would constitute a *casus belli* with the United States. Great excitement prevailed in Carácas, associations being formed for the boycott of British goods and for national defense; but, wiser counsels prevailing on both sides, diplomatic relations were resumed in 1897. José Andrade became President in 1898. The boundary matter was submitted to arbitration and finally settled on 3 Oct. 1899 by the award of the tribunal of Paris.

Cipriano Castro, who had assumed the executive power late in October (and did not receive confirmation by a constituent assembly until February 1901), was in office when Great Britain, Germany and Italy declared a blockade of Venezuelan ports (January 1903) to enforce payments by Venezuela to compensate foreigners for the damage to property sustained by them during various revolutions. Castro's government agreed to the arbitration of the claims by third parties and protocols with all the countries were signed within a few months. Castro was again elected, with General Gomez as one of the Vice-Presidents, and served two-thirds of his term; but in 1909 he sailed for Europe, and then General Gomez interpreted correctly the preference of his people when by a *coup d'état*, he secured without bloodshed his own safety and the Presidential power. He was established as constitutional President by virtue of the election of April 1910. The Gomez government survived two rebellions in 1913, the first an uprising in the state of Trujillo and the second an insurrection in the southwest in favor of Castro, the ex-President. The insurrectionary forces were dispersed. On 19 April 1914 Congress elected Gen. V. Márquez Bustillos as provisional President of the republic. A new Constitution went into effect 13 June 1914. On 3 May 1915 the Congress by unanimous vote elected General Gomez as President of the republic for the term 1915–22.

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VENEZUELA, Gulf of, or GULF OF MARACAIBO, in the northwest of Venezuela, extends between the peninsulas of Goajira (in Colombia) and Paraguana, with a maximum width east to west of 165 miles, and a length of 60 miles from its opening on the Caribbean Sea to the narrow inlet communicating with Lake Maracaibo (q.v.).

VENEZUELAN BOUNDARY DISPUTE. In 1885 a crisis arose between Great Britain and Venezuela regarding the boundary line separating the latter country from British Guiana, a question which had been long in dispute. The controversy dated back to 1814, when Great Britain acquired by treaty with the Netherlands the provinces of Demerara, Essequibo and Bernice. Venezuela originally claimed her limits to be those of the captaincy-general of 1810, but contended herself with claiming the line of the Essequibo River as the true boundary. Great Britain apparently acquiesced till 1840, when she commissioned Sir R. Schomburgk to lay out the boundaries which he proceeded to do by including a large area which had before been considered by Venezuela a portion of her domain, and to the possession of which by Great Britain a vigorous protest was entered. After much diplomatic negotiation the monuments set up by Schomburgk were removed by the order of Lord Aberdeen. Other boundaries were from time to time suggested, but none agreed on, till finally, in 1886, Great Britain returned to her contention of 1840, and claimed all the territory within the Schomburgk line. The controversy continued till 1894, when a Venezuelan force entered the disputed territory and raised the flag of the latter country at Yuruan. The following year the British police removed the flag, for which they were arrested, but finally released, Great Britain setting up a demand for reparation somewhat in the nature of an ultimatum.

The United States became a party to the dispute by the act of Congress directing the President to urge Great Britain to submit to arbitration the question whether Venezuela was entitled to the territory between the Essequibo and the Orinoco. In his annual message to Congress, 3 Dec. 1895, President Cleveland called attention to the boundary controversy and the representations made by the United States government to that of Great Britain with a view of securing the submission of the dispute to arbitration. On the 17th he sent a special message to Congress accompanied by the answer of the British government to the representations mentioned, and a recommendation that Congress authorize the appointment of a commission to determine the divisional line between Venezuela and British Guiana. The message created intense excitement throughout Europe and America. Both Houses of Congress passed a commission bill unanimously and indulged in much talk of war. Under the bill the President announced, 1 Jan. 1896, the appointment of the following commissioners: David J. Brewer, associate justice of the United States Supreme Court; Richard H. Alvey, chief justice of the Court of Appeals of the District of Columbia; Andrew D. White, ex-United States Minister to Russia; Frederick R. Coudert and Daniel C. Gilman, president of Johns Hopkins University. Subsequently the commission

organized and chose Justice Brewer for its president.

The commission invited the governments of Venezuela and Great Britain to formulate and present to it their respective cases in support of their claims. The invitation was complied with by both governments. Independently of these cases the commission gathered a great mass of evidence bearing on the claims, and continued its sittings till 27 Feb. 1897, when, Venezuela and Great Britain having signed a treaty providing for the submission of the claims to arbitration, the commission considered its work at an end, made its report to the President and terminated its existence. The treaty between Venezuela and Great Britain was signed in Washington, D. C., on 2 Feb. 1897, and provided for the appointment of an arbitration tribunal to determine the boundary line, consisting of five jurists, the two on the part of Venezuela being Chief Justice Fuller and Associate Justice Brewer, of the United States Supreme Court; the two on the part of Great Britain being the Rt. Hon. Baron Herschell and the Hon. Sir Richard Henn Collins; and the fifth to be selected by the four jurists nominated in the treaty, or, in the event of their failure to agree, by the king of Norway and Sweden, the fifth jurist to be the president of the tribunal. The treaty provided that the tribunal should sit in Paris, France. The tribunal was completed by the selection of Professor Martens, a distinguished Russian jurist, professor of international law in the University of Saint Petersburg, and legal writer, as the fifth member and president. The award of the tribunal, which was delivered 3 Oct. 1899, gave Great Britain the Schomburgk line, with the exception of Barima Point, at the mouth of the Orinoco, and a strip of territory between the Wenamu and Cuyuni rivers; but it was decided that the mouth of the Orinoco should be open to the British and both banks of a part of the Cuyuni where the Schomburgk line had given them only one bank. Consult Cleveland, G., 'The Venezuelan Boundary Controversy' (New York 1904); Ralston, J. H., 'Venezuelan Arbitrations of 1903' (Washington 1904); Storrow, J. J., 'The Brief for Venezuela' (London 1896); Strickland, J., 'Documents and Maps of the Boundary Question Between Venezuela and British Guiana' (London 1896); 'United States Venezuelan Boundary Commission, Report and Accompanying Papers' (3 vols., and atlas, Washington 1897).

VENI CREATOR SPIRITUS, vē'nī krē-ā'tôr spĭr'ĭ-tŭs, the first words of a well-known Latin hymn, which are employed as its title. The hymn is addressed to the Holy Spirit, is sung in ordination offices of the Roman Catholic and Anglican churches and at Whitsuntide, and formerly at the celebration of the Holy Communion. Saint Ambrose 350 A.D. is supposed by some authors to have written it. The first English version added to the Prayer Book in 1662 has been attributed to John Dryden. The full text of the original hymn is as follows:

Veni Creator Spiritus
Mentes tuorum visita;
Imple superna gratia
Quæ tu creasti pectora.

Qui diceris Paraclitus
Altissimi Dei num,
Fons vivus, ignis, charitas,
Et spiritalis unctio.

Tu septiformis munere
Dextræ Dei tu digitus;
Tu rite promissum Patris
Sermone ditans guttura.

Accende lumen sensibus
Infunde amorem cordibus;
Infirma nostri corporis
Virtute firmans perpetim.

Hostem repellas longius
Pacemque dones protinus;
Ductore sic te prævio
Vitemus omne noxium.

Per te sciamus da Patrem
Noscamus atque Filium;
Te utriusque Spiritum
Credamus omni tempore.

Sit laus Patri cum Filio
Sancto simul Paraclito;
Nobisque mittat Filius
Charisma Sancti Spiritus. Amen.

VENIAL SIN (O. F. *venial,* from Lat. *venialis,* pardonable), in Roman Catholic theology, a term used to signify the lesser transgressions of the law of God or of the Church, in contradistinction to mortal sin, which means spiritual death, deserves eternal punishment and demands divine power for renewal. In the case of venial sin, "grace is still left by which the sin may be repaired."

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